

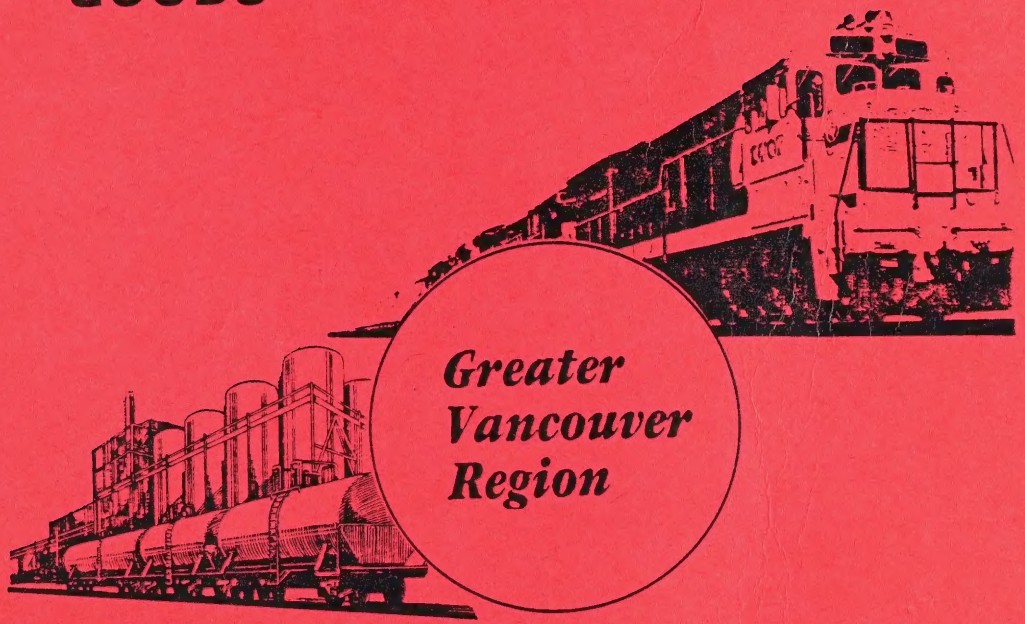


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Government
Publications

Railroad

**TRANSPORT
OF DANGEROUS
GOODS**




*Greater
Vancouver
Region*

RAILROAD TRANSPORT OF DANGEROUS GOODS
IN THE GREATER VANCOUVER REGION



Pacific Region
Railway Transport Committee
Vancouver, B.C.
May 1982



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Canadian Transport
Commission

Commission canadienne
des transports

Suite 1740,
1055 W. Georgia Street,
Vancouver, B.C.
V6E 3P3

May 20, 1982

Dr. John Heads,
Executive Director,
Railway Transport Committee,
Canadian Transport Commission,
Hull, Quebec
K1A 0N9

Dear Dr. Heads:

Further to our recent conversations, I have today forwarded to your office a number of copies of a report titled 'Railroad Transport of Dangerous Goods in the Greater Vancouver Region'.

This document is intended to provide an assessment of local rail handling of hazardous materials from an overall perspective. It addresses areas which might not be covered in our day-to-day inspection routines. For quick review Part 4 Pages 65 to 75, comprise a brief recapitulation and a summary of recommendations.

It is the hope of Regional staff members who participated in the preparation of this document, that it might serve as a focal point for discussion and comment. To such end, sufficient copies have been retained on hand in this office for distribution as you may direct.

Yours truly,

J.J. Eisler
Regional Manager

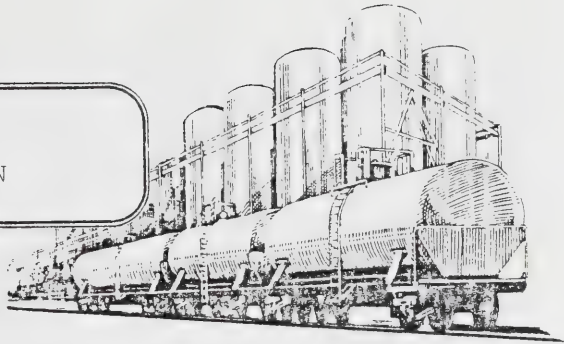
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PART 1
INTRODUCTION



PART 1

1.1 INTRODUCTION

Situated in the south west corner of mainland British Columbia, the Metropolitan Vancouver area is comprised of a number of communities with a combined population in excess of 1.25 million. With deep water access provided on the lower reaches of the Fraser River as well as on Burrard Inlet, and served by six railway companies, the area accommodates bulk handling enterprises for coal, potash, sulphur and grain. There are facilities serving the chemical, petro-chemical, wood products, agricultural, manufacturing, fishing, mining and tourist industries. In terms of tonnage exported the Port of Vancouver is Canada's largest, ranking second in North America and in the top 15 world-wide.

A portion of the very large volume (approximately 50 million tonnes in 1981) moving through the Vancouver area involves materials which are acknowledged to be hazardous. Some of these products are exported to overseas destinations, others are transported southward by rail for consumption in the United States. Further quantities are moved by ferry to Vancouver Island or to water-locked destinations along the British Columbia coastline. Local processing and consumption are also accommodated.

The railway safety record with respect to movement of hazardous goods through the British Columbia Lower Mainland is very good. There is no record in this office of an injury or fatality associated with a rail related accident involving such materials. However, there have been incidents

1.1 INTRODUCTION (continued)

involving rail movement of dangerous materials, and these occurrences lend credence to the growing public demand that efforts be made to minimize the potential for mishap.

This document has been prepared with the assistance of the following members of the Regional Railway Transport Committee staff in an effort to highlight areas of concern, to induce further discussion, and to suggest possible alternatives which may be available from a regulatory point-of-view.

A.W. Taggart	-	Operations Chief
J.M. Anderson	-	Special Duties
G.M. Brown	-	Regional Dangerous Commodities Officer
G.B. Gallagher	-	Regional Accident Investigation Officer
K.W. Gehman	-	Regional Engineer

J.J. Eisler
Regional Manager
May 1982

PART 1

1.2 SCOPE OF REVIEW

The scope of this review has been limited to the operations of Federally regulated railways relative to the movement of hazardous materials within the Lower British Columbia Mainland.

Regional Railway Transport Committee staff members normally undertake day-to-day inspections to ensure compliance with existing legislation and regulation. It is intended that this document be supplementary to such activity and address areas which might not be covered by daily routine.

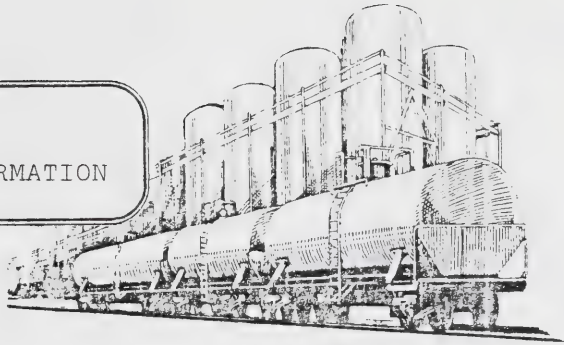
This report is not intended to represent RTC policy nor does it present a complete overview of the hazardous commodity traffic situation since it does not cover such areas of interest as alternative modes of transport, facilities on private property, etc.

What has been undertaken is an overall assessment of local rail handling of hazardous materials, with the following areas selected for special attention.

- (a) Ferry Slip traffic
- (b) Major Railway Yard Installations
- (c) Services to Major Industries
- (d) Interchange Facilities

The details provided in this document are by EXCEPTION, that is, detailed coverage is provided only in those instances where particular comment is considered to be of interest.

PART 2
BACKGROUND INFORMATION



PART 2

2.1 COMMUNITIES AND RAIL ROUTES

The metropolitan Vancouver area is served by the following Railway Companies:

- Canadian Pacific (RTC jurisdiction)
- Canadian National (RTC jurisdiction)
- Burlington Northern (RTC jurisdiction)
- B.C. Hydro Rail (portions under RTC jurisdiction)
- British Columbia Railway (Provincial jurisdiction)
- B.C. Harbours Board Railway (Provincial jurisdiction)

As previously noted, the British Columbia Lower Mainland accommodates a population well in excess of 1.25 million inhabitants. The major communities located in this area, categorized by population density are listed below:

Vancouver.....	410,000
Surrey.....	146,000
Burnaby.....	135,000
Richmond.....	95,000
Delta.....	74,000
Coquitlam.....	65,000
North Vancouver District..	65,000
Langley Township.....	44,300
Matsqui District.....	41,000
New Westminster.....	38,000
West Vancouver.....	36,000
North Vancouver City.....	33,500
Maple Ridge.....	32,000
Port Coquitlam.....	27,500

2.1 COMMUNITIES AND RAIL ROUTES (continued)

Mission.....	20,000
Langley City.....	15,000
Port Moody.....	14,500
White Rock.....	13,500
Cloverdale.....	11,200

The location of these communities has been illustrated in Figure 1, Page 8. Also shown are the major railway lines traversing the Lower Mainland, identified by operating Company. Itemized on the drawing are a number of areas of interest with respect to the movement of hazardous materials.

The schematic diagram shown in Figure 2, Page 9 is a partial illustration of rail routes through the Lower Mainland detailing route miles.

LEGEND

- (A) - CP Ferry
- (B) - CN Ferry
- (C) - Coquitlam Yard (CP)
- (D) - Thornton Yard (CN)
- (E) - Canadian Occidental Petroleum
- (F) - Trans Mountain Oil (Westridge)
- (G) - Canadian Industries Ltd.
- (H) - Lake City Industrial Area
- (J) - Sapperton Interchange Area
- (K) - Brownsville Area
- (L) - Mayfair Terminal
- (M) - Rowlison Subdivision (CN)

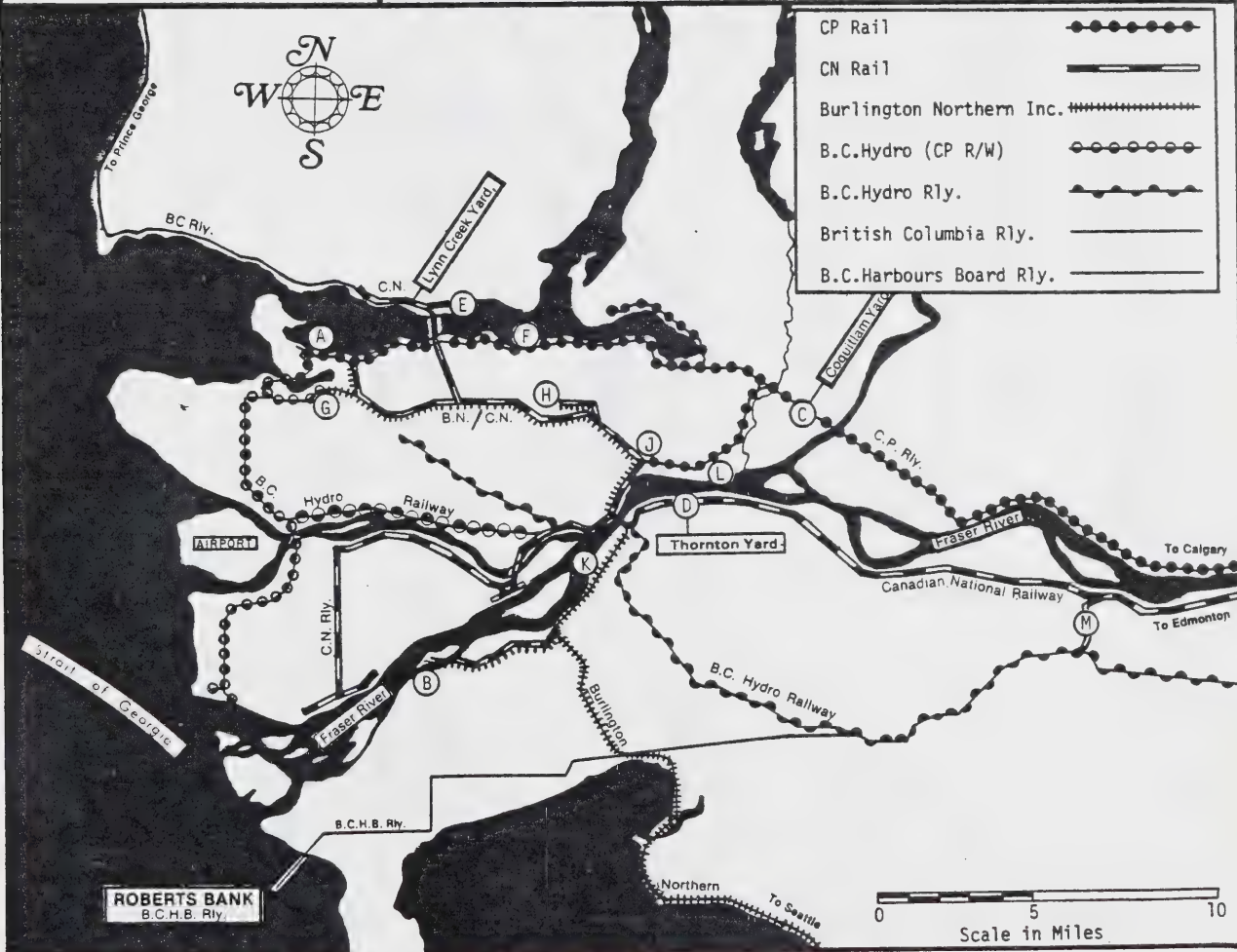
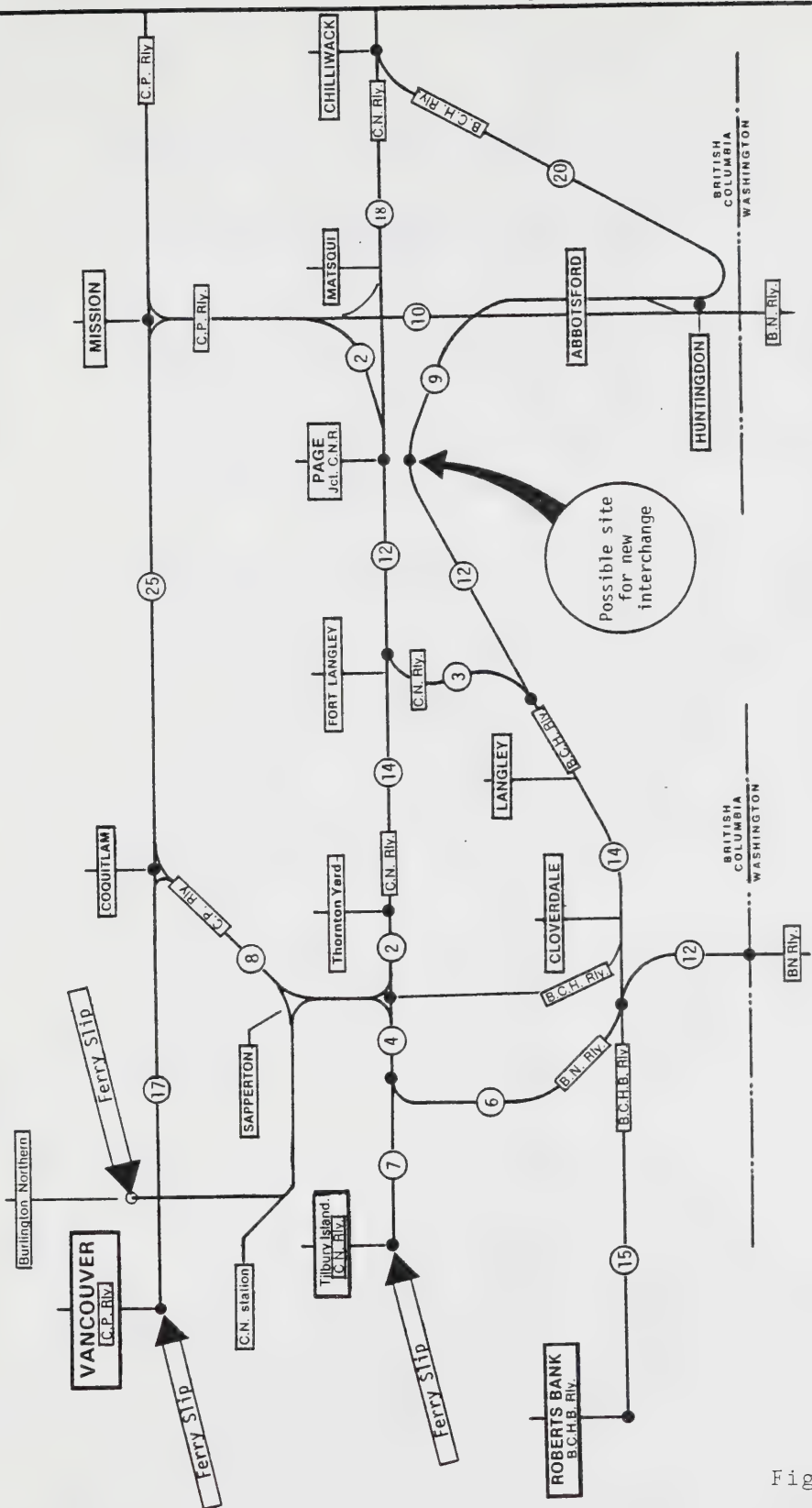


Figure 1 Communities and Rail Routes through the Lower British Columbia Mainland



Schematic Diagram Showing Rail Routes
Through The Lower British Columbia Mainland

- Not to Scale -

Approximate distances in miles shown thus - ● - 15 - ● -

Figure 2

PART 2

2.2 HAZARDOUS MATERIALS RAIL TRAFFIC

Carload movement of hazardous materials into and out of the Lower British Columbia Mainland has been estimated on the basis of a six month observation period undertaken in 1981. As detailed throughout this report the observed volumes of such traffic are therefore SIX MONTH totals unless otherwise indicated.

Movement of the subject kinds of traffic at a given location, or through a particular facility has been documented by direction of travel. By way of illustration, Figure 3, Page 12 shows 6425 carloads westbound on the Canadian Pacific main track east of Coquitlam Yard. The same section of trackage accommodated 1016 eastbound carloads during the six month period of observation. Translated into annual figures this would be 12,850 westbound carloads and 2032 eastbound carloads.

Also illustrated below in Figures 4 and 5 are total carloads of dangerous goods moving into and out of the Metropolitan Area with segregation by route. A breakdown by commodity is also provided. These figures cover a SIX MONTH period in 1981.

Referring to Figure 4 for example:

During a six month period in 1981, a total of 11,020 carloads of dangerous goods moved into the Metropolitan Area. Of that total 6425 arrived via the CP Rail Coquitlam Yard facility. During the same period of time 4141 carloads moved into CN Rail's Thornton Yard.

2.2 HAZARDOUS MATERIALS RAIL TRAFFIC (continued)

Out of a total of 11,020 carloads arriving, 3589 contained liquified petroleum gas, 124 carried explosives, etc.

Similarly, referring to Figure 5 it will be noted that:

A total of 4598 carloads were moved out of the Metropolitan Area during the six month observation period. Of that quantity 1051 carloads were shipped via the CP Rail ferry facilities located in downtown Vancouver while 1505 carloads exited on the Burlington Northern main track via New Westminster for United States destinations.

Out of a total of 4598 carloads leaving the area, 2269 contained liquified petroleum gas, 468 carried corrosive materials (acids), 203 were loads of chlorine, etc.

LEGEND

Key map shows Greater Vancouver and the Lower Fraser Valley

Railways - RTC jurisdiction ++++++
 - Provincial jurisdiction -----

Typical carload traffic during the first SIX MONTHS of 1981 shown thus -



W - indicates westbound traffic
 E - indicates eastbound traffic
 etc.

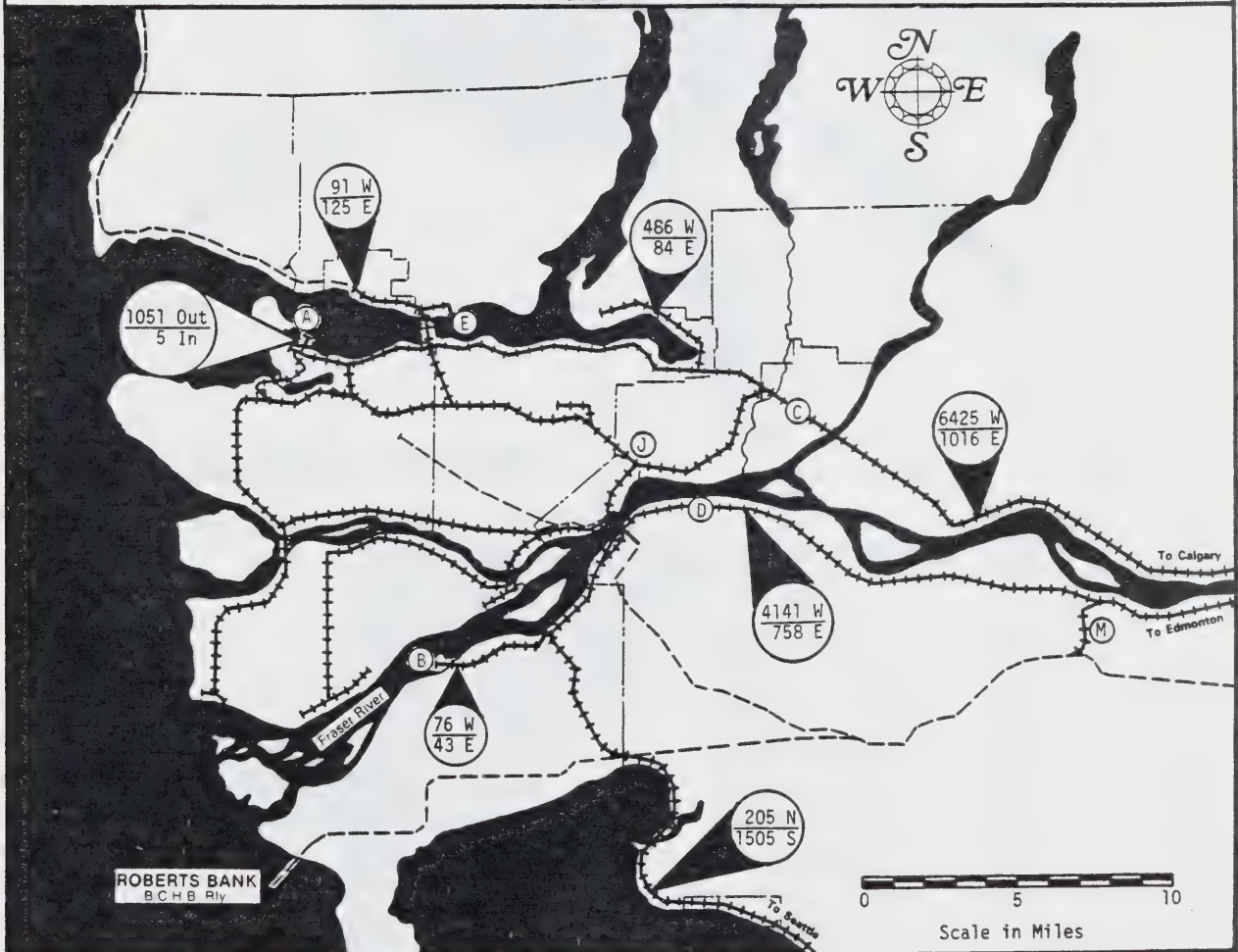


Figure 3 Plan showing typical hazardous material carload traffic for a six month period in 1981. Rail routes are differentiated according to Regulatory Jurisdiction

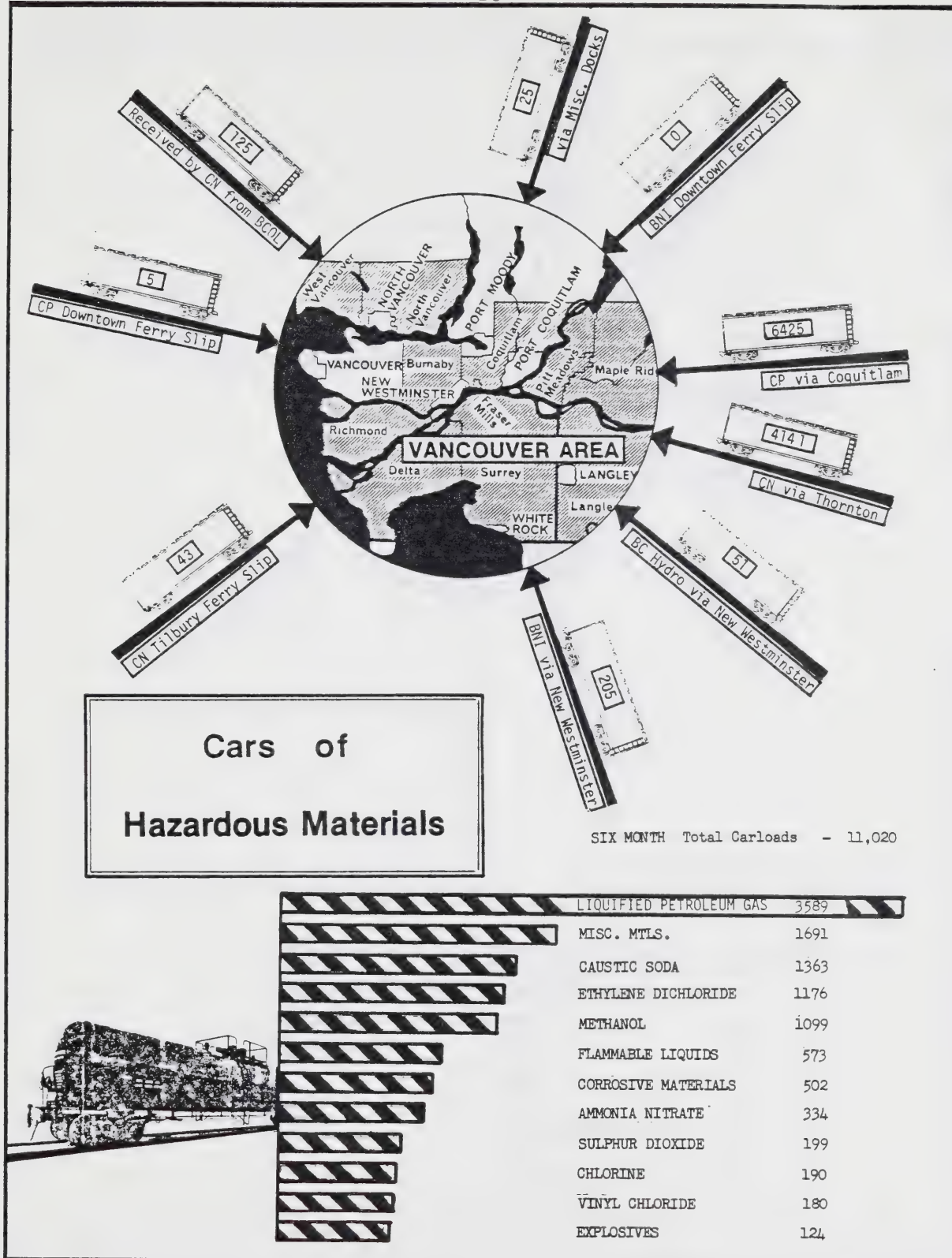


Figure 4 Hazardous materials moving into the Metropolitan Vancouver area

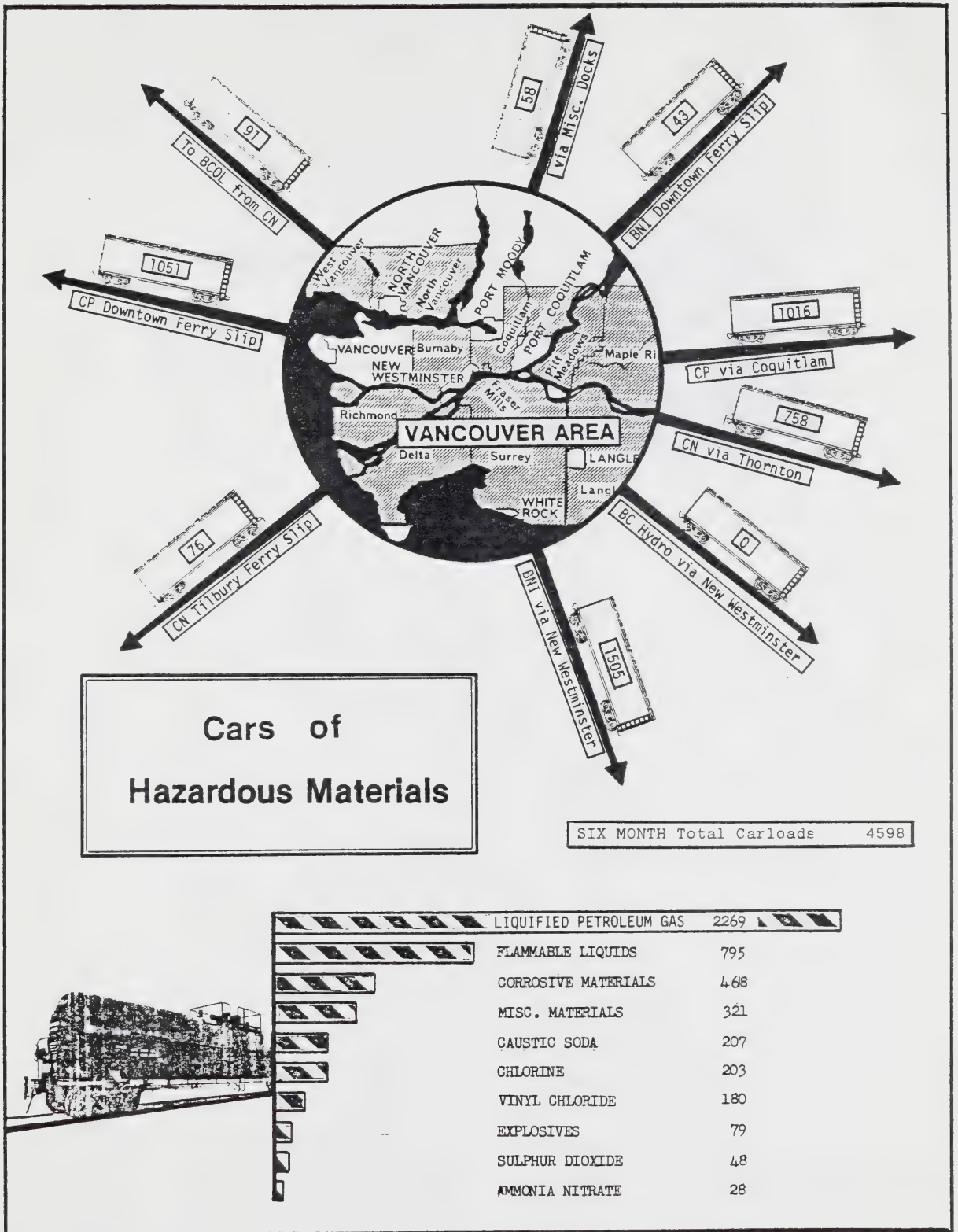
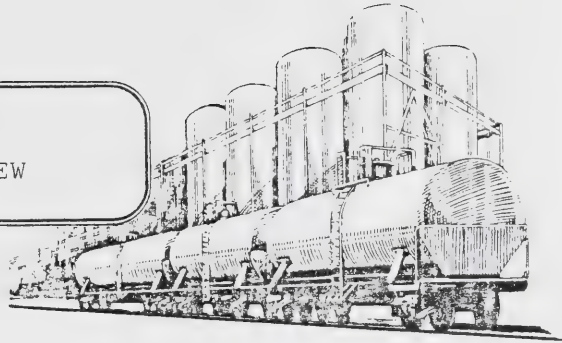


Figure 5 Hazardous materials moving out of the Metropolitan Vancouver Area

PART 3
DETAILED REVIEW



PART 3

3.1 FERRY SLIP TRAFFIC AND INSTALLATIONS

Car barge service from the Lower B.C. Mainland to adjacent offshore destinations is offered by Canadian National, Canadian Pacific and Burlington Northern.

The two existing Canadian Pacific facilities as illustrated in Figure 6 are located on Burrard Inlet in the shadow of downtown Vancouver skyscrapers from which point car barge service has operated for nearly 100 years. Present destinations include Nanaimo (Wellcox) on Vancouver Island as well as industrial facilities at Crofton, Port Mellon, Woodfibre, Port Alice, Rupert Inlet and Duncan Bay. Nanaimo is located on the existing E & N Railway network, however the other locations are isolated.

The Burrard Inlet CP ferry slips (there are two adjacent to one another) are part of an intermodal facility, with approximately 75 percent of the present traffic comprised of trailers (motor vehicle) and 25 percent rail cars. Vessels presently in service include three motorized transporters and three barges. Rail loadings appear to average about 55 cars per day or approximately 18,000 annually.

During a six month observation period there were 1051 carloads of hazardous goods moving out of the CP slips and 5 carloads arriving. By commodity, the traffic was as follows:



Figure 6 Location of CP and BNI ferry slip facilities in Vancouver, B.C.

3.1 FERRY SLIP TRAFFIC AND INSTALLATIONS (continued)

Canadian Pacific Ferry Slip Carload Traffic in
Hazardous Materials
(SIX MONTH Observation Period)

Liquified Petroleum Gas	281
Sulphuric Acid	187
Mixed Merchandise	164
Sulphur Dioxide	135
Chlorine	73
Explosives	61
Anhydrous ammonia	52
Fertilizer	56
Caustic Soda	21
Others	21
<hr/>	
Total six month traffic	1051 cars

In contrast to the City centre locations of the CP and BNI ferry slips on Burrard Inlet, Canadian National is situated on the south side of the lower portion of the Fraser River in a relatively isolated area (see Figure 7). Like its CP counterpart, the CN Tilbury Island slip is presently being utilized to accommodate both rail cars and highway trailer units, although volumes are not as great as those moving CP. It is estimated that total rail movements out of Tilbury Island are approximately 5,200 cars annually. During a six month observation period some 76 carloads of dangerous goods moved out over the slip and 43 carloads arrived. Traffic mix was as follows:

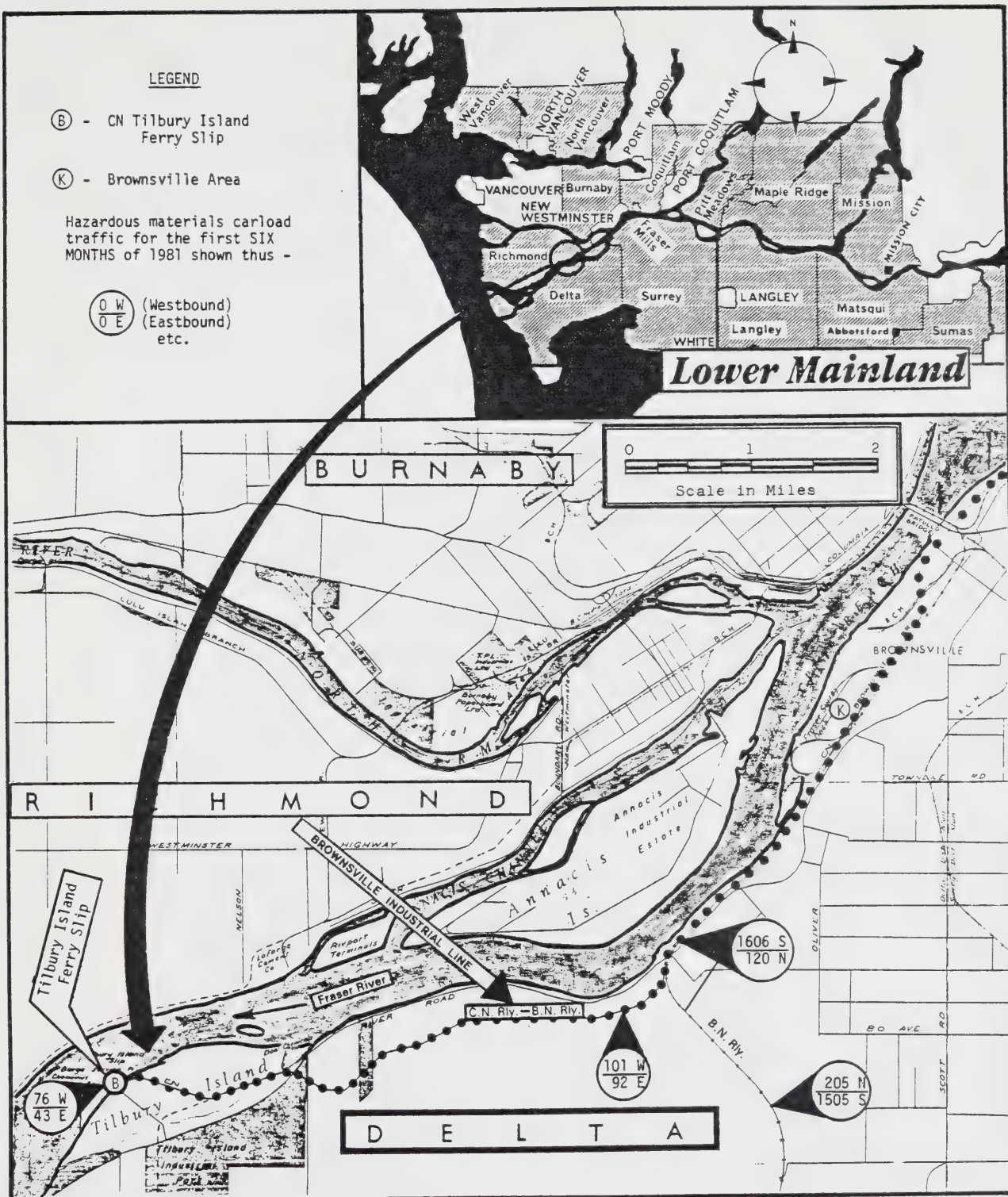


Figure 7 CN Tilbury Island Ferry Slip in Delta, B.C.

3.1 FERRY SLIP TRAFFIC AND INSTALLATIONS (continued)

	<u>Moving Out</u>	<u>Arriving</u>
Explosives	48	19
L.P.G.	23	-
Ammonia Nitrate	4	-
Mixed Merchandise	1	-
Acids	-	24
	<hr/>	<hr/>
SIX MONTH Totals	76	43

Rail traffic is handled under contract utilizing one motor vessel with the bulk of the materials moving to Vancouver Island destinations - Point Ellice in Victoria and Cowichan Bay near Duncan. A modest amount of cargo is handled to James Island (37 carloads of explosives in a six month period) and to a National Defence Installation at Rocky Point (11 carloads in six months).

The Tilbury Island ferry slip structure was constructed in 1960/61 at a cost of about \$800,000 in what was then an area of small farms. Since that time the small holdings have largely disappeared as industrial development has occurred. At present the adjacent properties are occupied by such establishments as Dow Chemical of Canada Ltd., Inland Cement Industries Ltd., etc.

In addition, ten years ago, B.C. Hydro and Power Authority constructed a 175,000 barrel capacity storage tank in the area. Located some 700 to 800 feet distance from the slip structure, this insulated storage

3.1 FERRY SLIP TRAFFIC AND INSTALLATIONS (continued)

tank contains LIQUIFIED NATURAL GAS stored at minus 286 degrees Fahrenheit. It provides surge capacity (building up storage volumes during periods of low demand) for the Vancouver distribution system.

Residential accommodation in the Tilbury Island area is estimated at less than 500 people within a two mile radius of the site and the adjacent industries are not labor intensive. Thus the total combined population at any given time would probably not exceed 1000 people within a two mile radius of the facility.

The Tilbury structure is designed to a structural capacity (designated Coopers E-40) which is lighter than present day standards, however, at modest speeds with consequent low impact loadings, it can accommodate 100 ton cars. The apron width is relatively narrow, and track configurations is such that access by alternate barges available in the Vancouver area is extremely limited. Traffic can be handled at all stages of tide. .

Further site details are provided in appendices at the end of this report.

Burlington Northern, like CP Rail, operate from a Burrard Inlet site as illustrated in Figure 6. Original construction of the Burlington facility was probably undertaken in 1915 when an access route, known as the 'Burrard Inlet Line', was constructed to the waterfront. Located somewhat eastward of the city core area, the slip is situated in

3.1 FERRY SLIP TRAFFIC AND INSTALLATIONS (continued)

an area of industrial and commercial development, and is enveloped in the day-to-day stream of harbour commerce.

Barge service is provided by a motorized carrier, the 'Haida Transporter' which is chartered from Kingcome Navigation and maintains the following schedule:

One trip per week to Harmac which is near
Nanaimo on Vancouver Island

Five trips per week to Powell River which
is located up coast on the B.C. Mainland

Both Harmac and Powell River are water-locked destinations.

Annual traffic over the Burlington Northern Slip totals approximately 5000 to 6000 carloads. During a SIX MONTH observation period the following hazardous materials traffic was handled:

19 - Sulphuric Acid
16 - Sodium Hydroxide
8 - Sulphur Dioxide

This equates to an annual movement of some 80 to 100 carloads of regulated commodities.

The slip apron accommodates three parallel tracks and can be utilized to load some of the motorized transporters presently servicing the CP installation. On occasion, CN barge 109 has also loaded at this site. Because of sharp curvature on the approach trackage to the slip a maximum car length of 60 feet can be accommodated. As well there are tide restrictions; for tow-type barges the tide must be at least 8 feet and rising, while a five foot rising tide is necessary to handle the Haida Transporter.

3.1 FERRY SLIP TRAFFIC AND INSTALLATIONS (continued)

Details - CP Vancouver Ferry Slip

Subsequent to the opening of the CPR transcontinental line in 1885 which terminated in Port Moody, a contract was entered into between the CPR and British Columbia for the extension of the mainline to Coal Harbour. The railway terminus was to be established in the vicinity of Coal Harbour in exchange for 6000 acres of land in the area. A condition of the contract was for the railway to survey the land granted. This was undertaken by Alexander Hamilton who laid out the core of the new city much as it remains today. The Coal Harbour site offered a good depth of water at all stages of the tide, bad weather protection and a reasonably flat area of land on which to construct terminal yards and support facilities. On May 21, 1887 the Port Moody-Vancouver line was transferred from the Construction Department to the Operating Department of the railway.

One of the earliest records available to this office with respect to the Coal Harbour facilities is dated February, 1908, authorizing the construction of a ferry apron to be used in connection with the West Slip. Order No. 28839 dated October 3, 1919 referred to a second slip described as a combination truss three-track ferry slip with moving leaf. Order No. 83037 dated January 28, 1954 authorized construction of the car ferry facilities on the site of the West Slip, now known as A-3. Order No. R-4182 dated December 19, 1968 authorized construction of the present day slip A-1.

3.1 FERRY SLIP TRAFFIC AND INSTALLATIONS (continued)

Pier A-1 as it now exists has a limited range of tides in which cars can be handled. Loading is via three parallel tracks as well as a branching centre track which aligns with curved track on the vessels.

Pier A-3 is usable at all stages of the tide but the apron has only a single approach track, branching near the end of the apron (as in A-1) with curved track required on the vessel.

Discussion

Rightly or not, the movement of hazardous materials through the downtown Vancouver waterfront area and, in particular, CP Rail ferry traffic, has received as much publicity as any aspect of the dangerous goods transport question. The hazards which are perceived to exist in association with these rail movements have received emphasis by virtue of several incidents which though they have not resulted in injury, have never-the-less been well covered by news media.

Pressure by the City of Vancouver has been steadily escalating in an effort to minimize or stop completely the rail movement of regulated commodities through the waterfront core area. The need for such restriction will no doubt be seen as becoming more urgent with the development of such facilities as the recently commenced Rapid Transit System or a downtown waterfront Convention Centre.

3.1 FERRY SLIP TRAFFIC AND INSTALLATIONS (continued)

The consensus of local opinion is now no longer a question of WHETHER the movement of dangerous goods through the downtown area should be prohibited but rather WHEN such prohibition should be arranged. The feeling is that it does not appear reasonable to expose such large numbers of people to potential difficulties even if the probability of an accident is low. Should an incident occur there is a possibility that many people could be placed in jeopardy.

The re-routing of that portion of the CP Rail traffic which is considered to be hazardous represents about 20 percent of the total volume moving through their ferry facilities, and at first glance it would appear to be a relatively simple matter to isolate these materials for shipment via other facilities. The fact that the bulk of the vessels presently in rail car ferry service are chartered from a single private carrier is a further simplifying denominator.

Unfortunately there has been no standardization in the development of permanent facilities with the net result that there is at present practically no interchangeability. A vessel serving one railway company cannot load or unload in a normal fashion at the facilities of another company. This means that any efforts to accommodate CP traffic through another railway's facilities will require, at the very least, modifications to accommodate traffic at destination.

Having noted the difficulties associated with the provision of alternative accommodation for hazardous goods presently moving through the Vancouver waterfront area, it is obvious

3.1 FERRY SLIP TRAFFIC AND INSTALLATIONS (continued)

that a detailed analysis of possible alternatives is beyond the scope of this report. It is, however, suggested that such review is the responsibility of the railways involved, in concert with the public being served. On this basis the following recommendations are offered.

Recommendation 1 Canadian National Railway
 Canadian Pacific Railway
 Burlington Northern Inc.

be requested to prepare submissions concerning the feasibility of establishing a standard Ferry Slip configuration to accommodate West Coast traffic. Such standard to be consulted when Railway Transport Committee approval is sought for alterations or new construction.

In this connection, the Railways shall make available to each other and to the Commission a package containing detailed information with respect to their Lower Mainland ferry slips, including configuration, load limitation, operational restrictions, approach characteristics and an inventory of vessels and barges presently being utilized.

Recommendation 2 Canadian Pacific be requested to prepare a submission with respect to possible scheduling modification to hazardous materials traffic moving through their

3.1 FERRY SLIP TRAFFIC AND INSTALLATIONS (continued)

Vancouver slips. This with a view to minimizing public exposure.

Recommendation 3 By copy of this report the suggestion be made to:

- (a) Greater Vancouver Regional District
 - (b) Canadian National Railway
 - (c) Canadian Pacific Railway
 - (d) Burlington Northern Railways
 - (e) The City of Vancouver
 - (f) The City of Chilliwack
- and other interested entities;

That consideration be given to the preparation of a Transportation Plan relative to the movement of hazardous materials with particular reference to the framework provided by The Railway Relocation and Crossing Act as a vehicle for the development of a transportation corridor with appropriate supporting facilities.

Note: See also Section 3.5 of this report concerning re-routing possibilities.

Recommendation 4 Canadian Pacific Railway be requested to give reasons why:

- (a) Carload lot shipments of LIQUIFIED PETROLEUM GAS and EXPLOSIVES cannot be diverted from the Vancouver Ferry

3.1 FERRY SLIP TRAFFIC AND INSTALLATIONS (continued)

Slip facilities by June 1, 1983.

- (b) Carload lot shipments of ALL DANGEROUS COMMODITIES cannot be diverted from the Vancouver Ferry Slip facilities by June 1, 1984.

Recommendation 5

Canadian Pacific Railway be advised that in the event satisfactory arrangements cannot be made to accommodate hazardous materials moving through the Vancouver Ferry Slip facilities, severe operating restrictions may be applied by the Committee.

Recommendation 6

Burlington Northern Inc. be requested to give reasons why carload lot shipments of ALL DANGEROUS COMMODITIES presently being handled through their Vancouver Ferry Slip installation cannot be diverted to other facilities by June 1, 1984.

3.2 MAJOR RAILWAY YARD FACILITIES

COQUITLAM YARD - C.P. RAIL

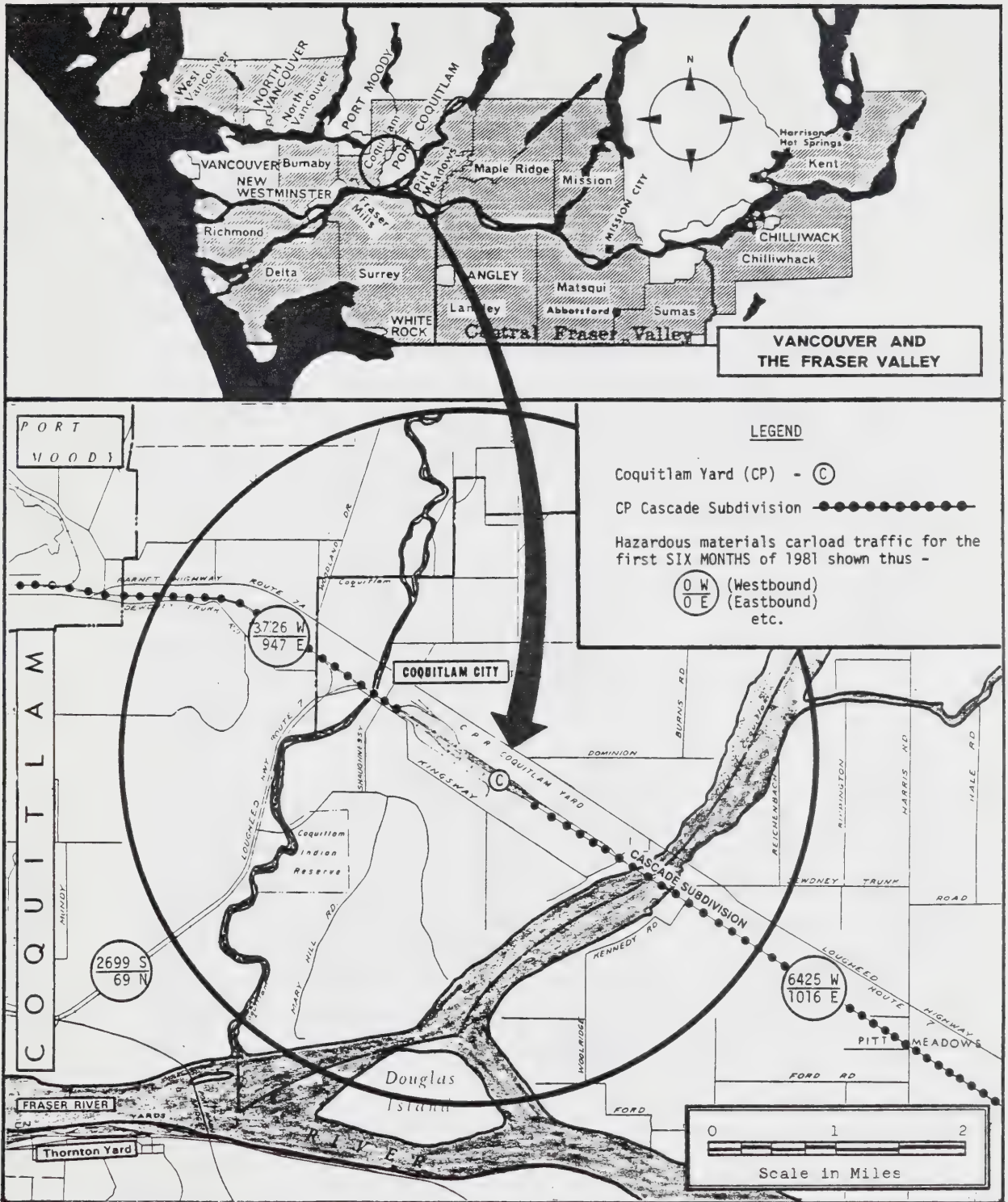


Figure 8 CP Coquitlam Yard, Port Coquitlam, B.C.

PART 3

3.2 COQUITLAM YARD - C.P. RAIL

Located entirely within the boundaries of the City of Port Coquitlam on the Cascade Subdivision, Coquitlam Yard is the major rail facility on the westerly end of the CP Rail transcontinental route. Records on hand suggest that initial expansion toward development as a rail yard dates from about 1910 or 1911 when the construction of several yard tracks was approved. It was also at this time that a grade separation over Shaughnessy Street at the west end of the Yard was undertaken.

Bounded on the east side by the Pitt River and on the west by the Coquitlam River, the yard occupies some 7% of the land area of the City of Port Coquitlam which has a present day population of 27,500 and a total area of slightly under 10 square miles.

During a six month observation period in 1981 it was noted that approximately 7400 carloads of hazardous materials were accommodated in Coquitlam Yard. Thus, regulated commodities represented about six percent of the loads moved through this yard in 1981. A breakdown of the dangerous goods moving into and out of Port Coquitlam during the period in question is shown below. For comparative purposes, similar traffic handled through the CN Thornton Yard is also itemized.

3.2 COQUITLAM YARD (continued)

	SIX MONTH TOTAL DANGEROUS GOODS MOVED THROUGH	
	CP COQUITLAM YARD	CN THORNTON YARD
CARLOADS OF		
Liquified Petroleum Gas	3076	719
Methanol	1152	-
Flammable Liquids	1035	43
Mixed Merchandise	798	626
Miscellaneous Mtls.	418	57
Corrosive Materials	333	109
Ammonia Nitrate	269	60
Sulphur dioxide	169	-
Chlorine	78	239
Explosives	67	76
Caustic Soda	46	1464
Ethylene dichloride	-	1176
Vinyl Chloride	-	180
Sodium Chlorate	-	101
Carbolic acid	-	49
SIX MONTH TOTAL	7441	4899

3.2 COQUITLAM YARD (continued)

The movement of dangerous commodities traffic through Coquitlam Yard has been the subject of some local publicity, probably stemming in large part from developments related to LPG traffic destined for the Westridge Terminal facilities of Trans Mountain Oil Pipeline Company, and also because of exposure associated with the movement of hazardous goods (particularly explosives) via CP Rail ferry installations. As a result of recommendations made by a special Task Force (which involved RTC staff), CP Rail was required to modify its handling procedures with respect to certain local traffic. A modest volume of explosives traffic, and a quantity of LPG destined for Westridge Terminals was thus required to be accommodated in Coquitlam Yard on isolated trackage under Special Permit authority. Simultaneously, it was suggested to CP Rail that a holding compound be developed in a less-populated area of the Lower Mainland to be utilized for the holding of dangerous goods traffic.

Several sites were examined by the railway, and discussions entered into with local entities regarding the establishment of a remote holding compound. Response to such construction proposals was negative on the part of the communities selected to accommodate the new facility. On the other hand, Coquitlam residents came to believe that developments in this regard were proceeding, and that when relocation occurred, the hazards associated with the movement of dangerous goods would disappear from their community.

3.2 COQUITLAM YARD (continued)

Without major operating changes involving substantial and continuous expenditures it is suggested that the construction of a remote holding facility would have no effect whatsoever upon 76 % of the hazardous traffic moving through Port Coquitlam.

Explosives, which had previously been a concern are now accommodated in a remote interior location (in fact some CP employees tend to credit this imposition with a recent loss of much of the traffic to a competing railway).

The significance of a remote holding facility would now relate almost exclusively to the handling of Westridge - destined LPG which represents about 24% of the dangerous goods moving through Coquitlam. When such traffic cannot be moved directly to Westridge, some of the carloads may be held in Coquitlam Yard. This does not happen continuously, but when it does, the rail yard, in effect, serves to provide surge capacity for the industry.

Railway Transport Committee regulations recognize that delivery cannot always be instantaneous, and thus emphasis is placed upon holding regulated materials no longer than 48 hours. In the case of Coquitlam Yard, a Special Permit has been issued permitting storage for longer periods of time when this becomes necessary.

3.2 COQUITLAM YARD (continued)

In many ways the existing yard configuration in Coquitlam represents a reasonably good arrangement for the handling of dangerous commodity traffic. This applies particularly to the trackage presently designated by Special Permit. The area is relatively isolated - adjoining tracks are kept clear, and, nearby rail cars on storage tracks act as buffers. The distance to railway right-of-way boundaries is substantial (in excess of 1000 feet) and adjacent areas generally have modest residential development or industries which are non-labor intensive. A field survey has determined that the approximate population within 2000 feet of the area presently designated by Special Permit is in the order of 1000 people. The estimated population within one mile of the existing holding facilities is probably less than 10,000.

On a long-term basis there are possibilities involving the re-direction of traffic away from the route through Coquitlam. These involve the development of interchange facilities as put forth in another section of this document. However, at present, and on the basis of previously noted considerations, it is suggested that unless the RTC develops a policy and supporting guidelines concerning a more universal approach toward the deployment of remote storage and handling facilities, emphasis should be shifted away from the concept of segregated accommodation for Coquitlam Yard traffic. The approach should rather be one which encourages:

- (a) Minimization of volumes held in Coquitlam
- (b) Minimization of delays and handling while
in the Yard

3.2 COQUITLAM YARD (continued)

(c) Strict compliance with existing regulations

The following proposals are therefore put forth with respect to the handling of hazardous materials in Coquitlam Yard.

Recommendation 7 Present efforts to establish a remote holding compound exclusively for CP Rail dangerous goods traffic be discontinued.

Recommendation 8 That the terms of the Special Permit covering the holding of dangerous goods in Coquitlam Yard be modified as follows:

(a) Effective January 1, 1983, the maximum number of loaded tank cars of Liquified Petroleum Gas destined Westridge Terminal on hand at any time in Coquitlam Yard shall be limited to the equivalent of three (3) days average daily requirement at Westridge Terminal.

(b) Effective June 1, 1984, the maximum number of loaded tank cars of Liquified Petroleum Gas destined Westridge Terminal on hand at any time in Coquitlam Yard shall be limited to the equivalent of two (2) days average daily requirement at Westridge Terminal.

3.2 MAJOR RAILWAY YARD FACILITIES (continued)

THORNTON YARD - C.N. RAIL

Thornton Yard is the major CN Rail facility at the westerly end of the transcontinental mainline. Formerly known as Port Mann, the yard originally served as the western terminus of the Canadian Northern Pacific Railway from about 1915. Because the yard is located on the south side of the Fraser River, access to major population centres which are located to the north must be gained by crossing the river. This is done via the Fraser River Bridge which is owned and operated by the Federal Department of Public Works. The structure serves not only CN, but also Burlington Northern, B.C. Hydro and Canadian Pacific. In fact, the D.P.W. bridge pre-dates Thornton Yard by about 10 years, having been constructed in 1904 (as the first crossing of the Fraser River estuary) to accommodate Vancouver-Seattle rail traffic as well as highway vehicles.

Thornton Yard is located entirely within the boundaries of the Corporation of the District of Surrey, a community of some 146,000 inhabitants. The property adjacent to the railway is generally residential in nature, with an estimated population of about 15,000 residing within a one-mile radius of the facility in question.

Like its nearby CP equivalent, CN's Thornton Yard is flat-switched and it is estimated that in 1981, just under 400,000 carloads were handled. Of that total, approximately 10,000 cars contained hazardous materials.

LEGEND

- Coquitlam Yard (CP) - (C)
- Thornton Yard (CN) - (D)
- Sapperton Area - (J)
- Brownsville Area - (K)
- Mayfair Area - (L)

Hazardous materials 6 MONTH
carload traffic in 1981 shown
thus -

O W (Westbound)
O E (Eastbound)
 etc.

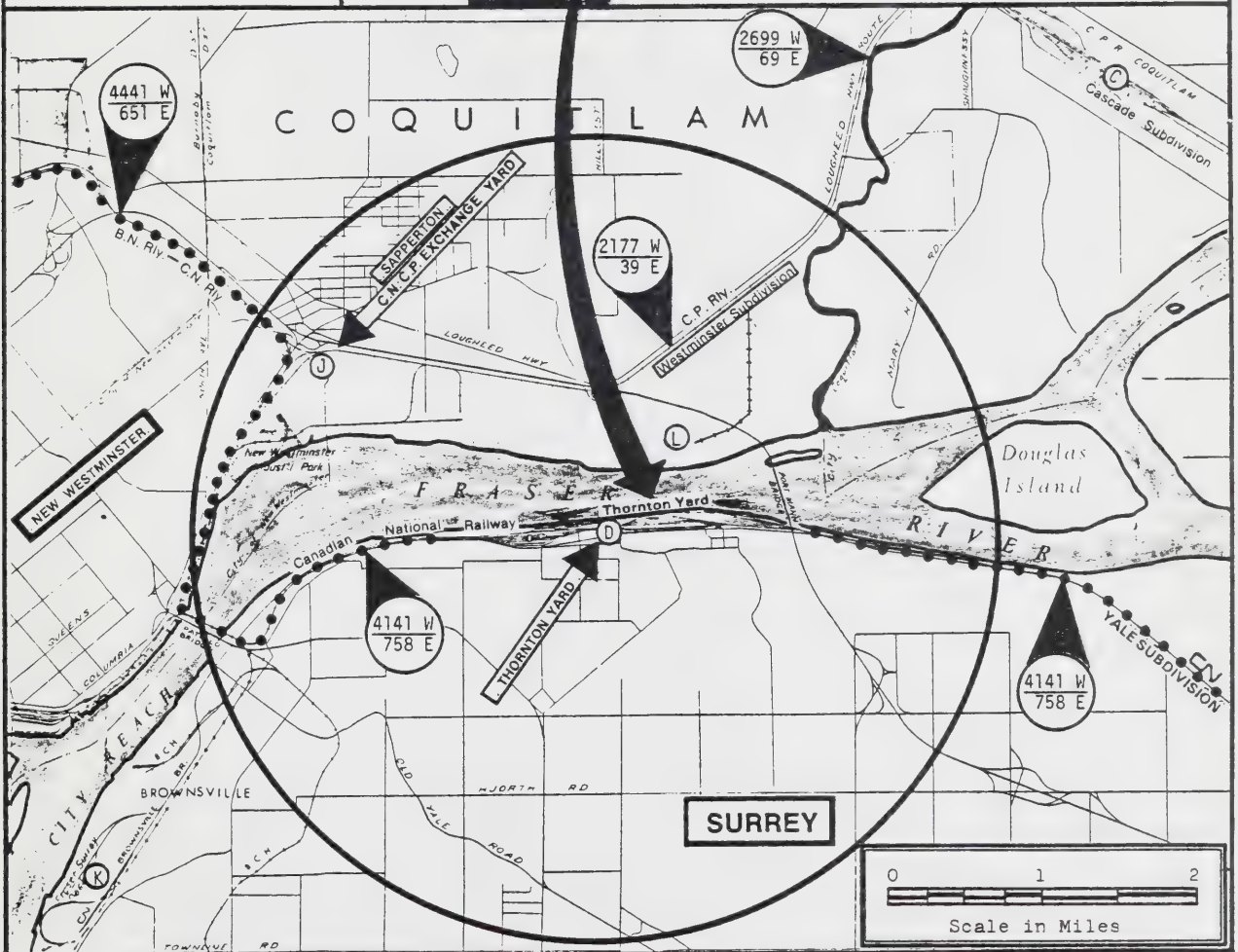
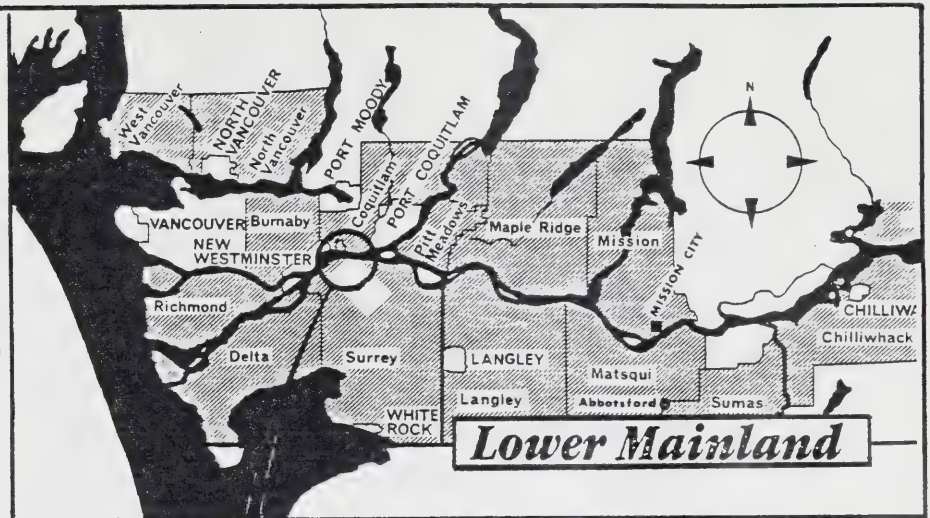


Figure 9 CN Thornton Yard, Surrey, B.C.

3.2 MAJOR RAILWAY YARD FACILITIES (continued)

A SIX MONTH review of the regulated goods moving into and out of this yard provided the following breakdown by carload:

Caustic Soda	-	1464
Ethylene Dichloride	-	1176
Liquified Petroleum Gas	-	719
Mixed Merchandise	-	626
Chlorine	-	239
Vinyl Chloride	-	180
Corrosive Materials (acids)	-	109
Sodium Chlorate	-	101
Explosives	-	76
Ammonia nitrate	-	60
Miscellaneous materials	-	57
Carbolic acid	-	49
Flammable Liquids	-	43
		<hr/>
SIX MONTH TOTAL		4899 cars

Comments with respect to these materials relate primarily to handling of interchange traffic as discussed in Section 3.4 of this report.

3.3 SERVICES TO MAJOR INDUSTRIES

A review of railway services to major industrial areas either shipping or receiving regulated commodities has been undertaken, with particular reference to the following:

- (a) The North Shore sector which accommodates Dow Chemical of Canada Limited and Canadian Occidental Petroleum Limited.
- (b) The New Westminster-Vancouver Corridor including Canadian Industries Limited and the Lake City industrial area.
- (c) The south shore of Burrard Inlet which includes Reichold Chemicals, Gulf Oil, Allied Chemicals, Shell Oil, Standard Oil and Trans Mountain Oil Pipeline Company (Westridge).
- (d) Ioco Imperial Oil Ltd. Refinery
- (e) Industrial areas in Richmond
- (f) Mayfair Terminal facilities

Most of the above-noted locations are shown in Figures 10, 11, 12, 13 and in other drawings included in this report.

Trans Mountain Oil Pipeline Company Westridge Terminal Mile 121 Cascade Subdivision, C.P. Rail, Burnaby, B.C.

Westridge Terminal has been the subject of considerable discussion and correspondence since 1974. In this respect observations and information contained in a report submitted by the Pacific Regional RTC office on February 3, 1975, file 48867.6.55 are still of interest and are paraphrased on the following pages.

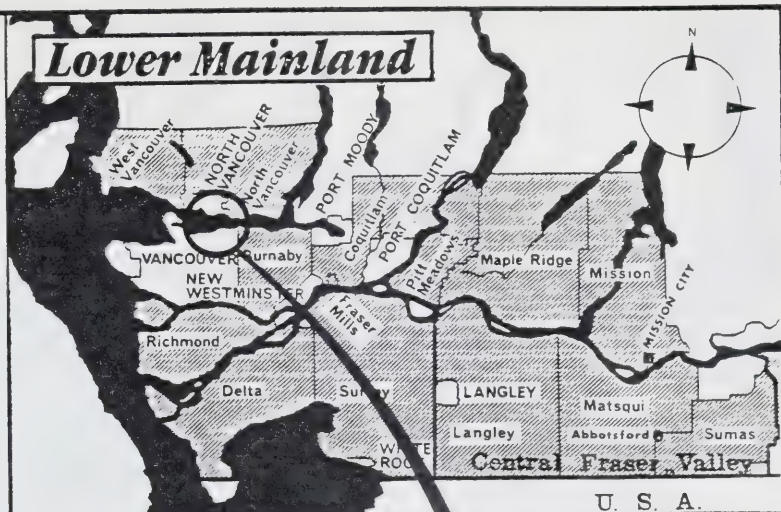
LEGEND

- (A) - CP Vancouver Ferry Slips
- (B) - Canadian Occidental Petroleum Ltd.

Hazardous materials carload traffic for the first SIX MONTHS of 1981 shown thus -

OO W (Westbound)
 OO E (Eastbound)
 etc.

Lower Mainland



NORTH VANCOUVER



Figure 10 Vancouver North Shore details

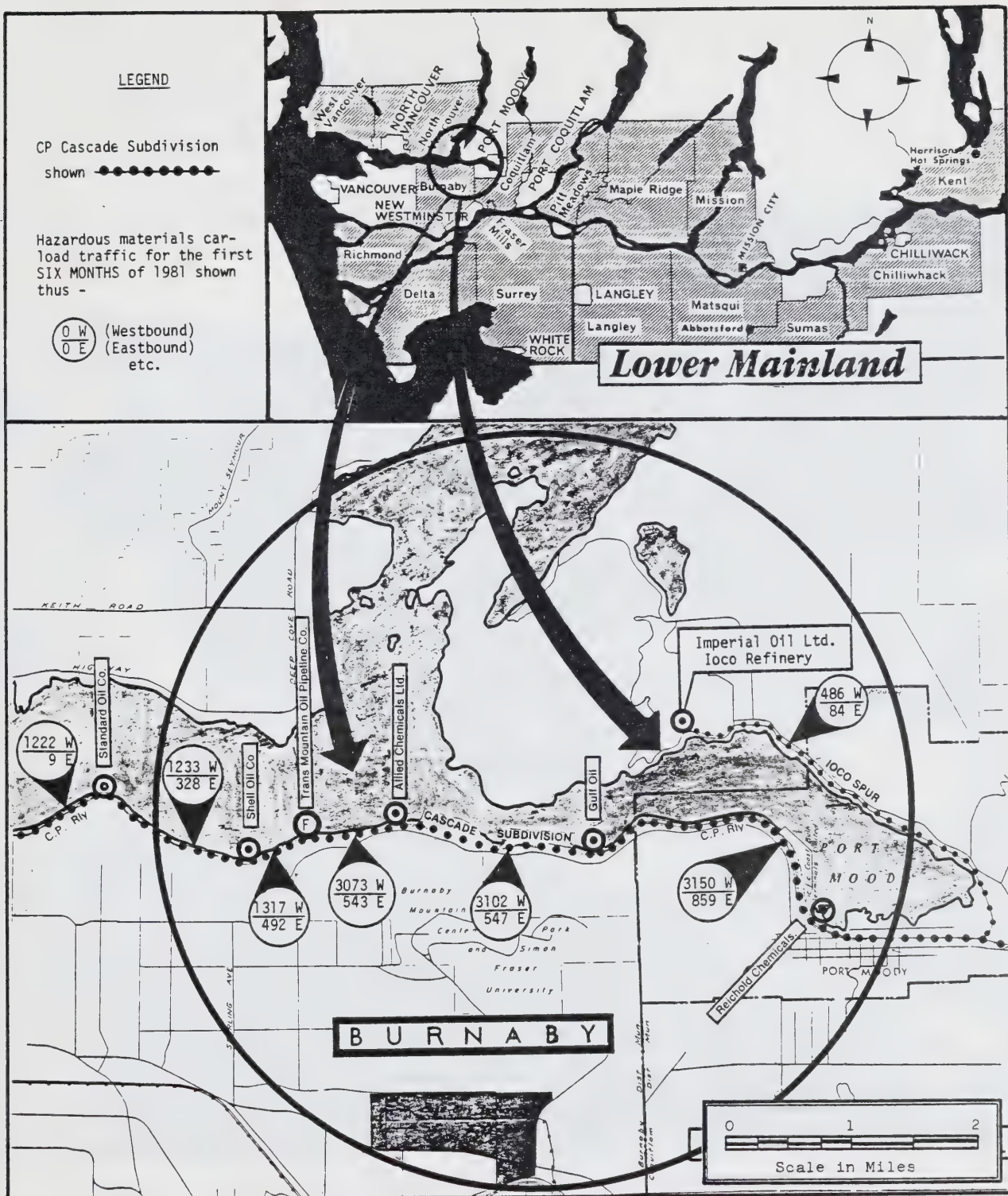


Figure 11 Burrard Inlet details

3.3 SERVICES TO MAJOR INDUSTRIES

Trans Mountain Oil Pipeline Company vicinity Mile 121
Cascade Subdivision, CP Rail, Burnaby

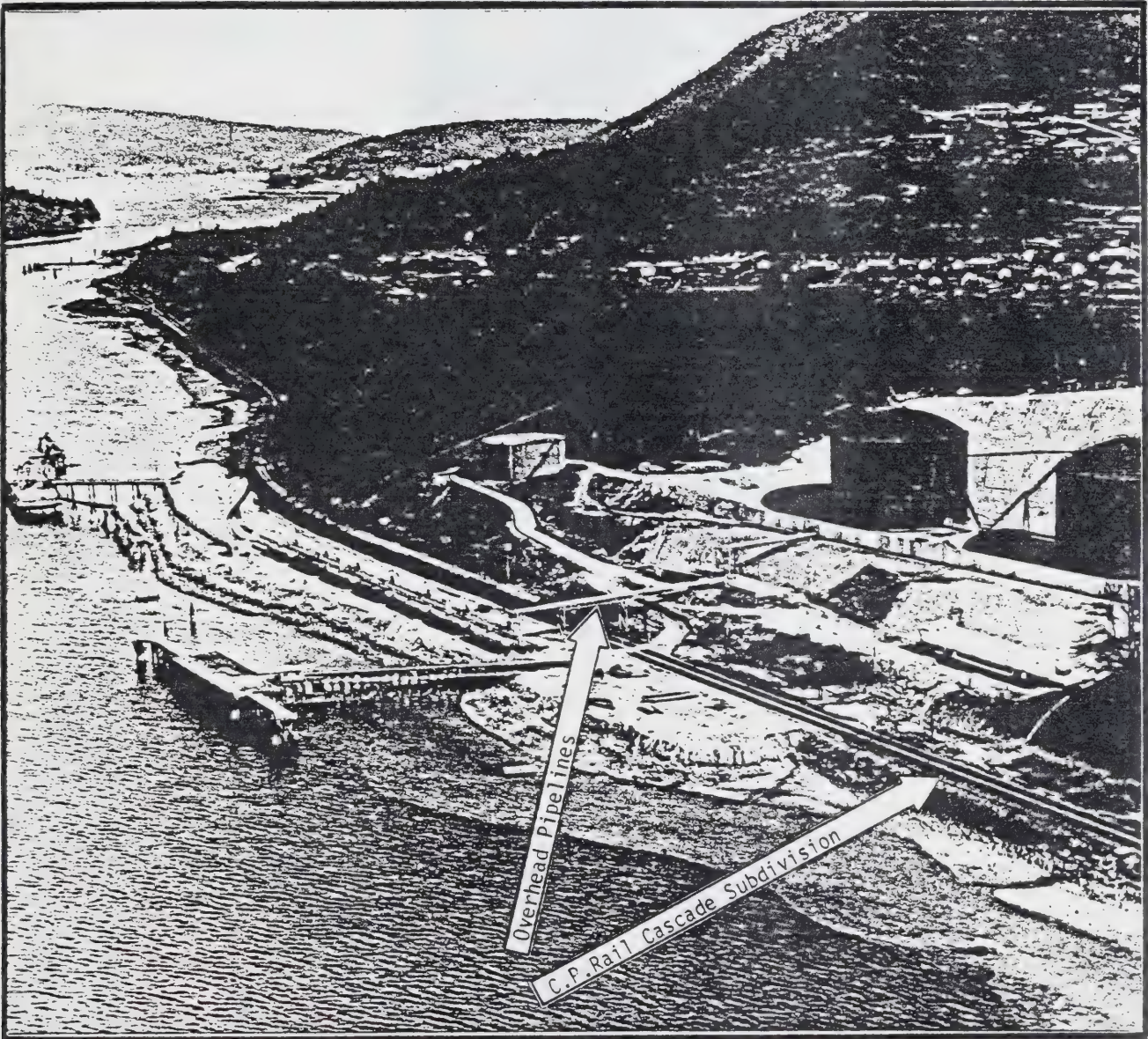


Figure 12 Westridge Terminal - Liquefied Petroleum Gas export facility on Burrard Inlet, Burnaby, B.C.

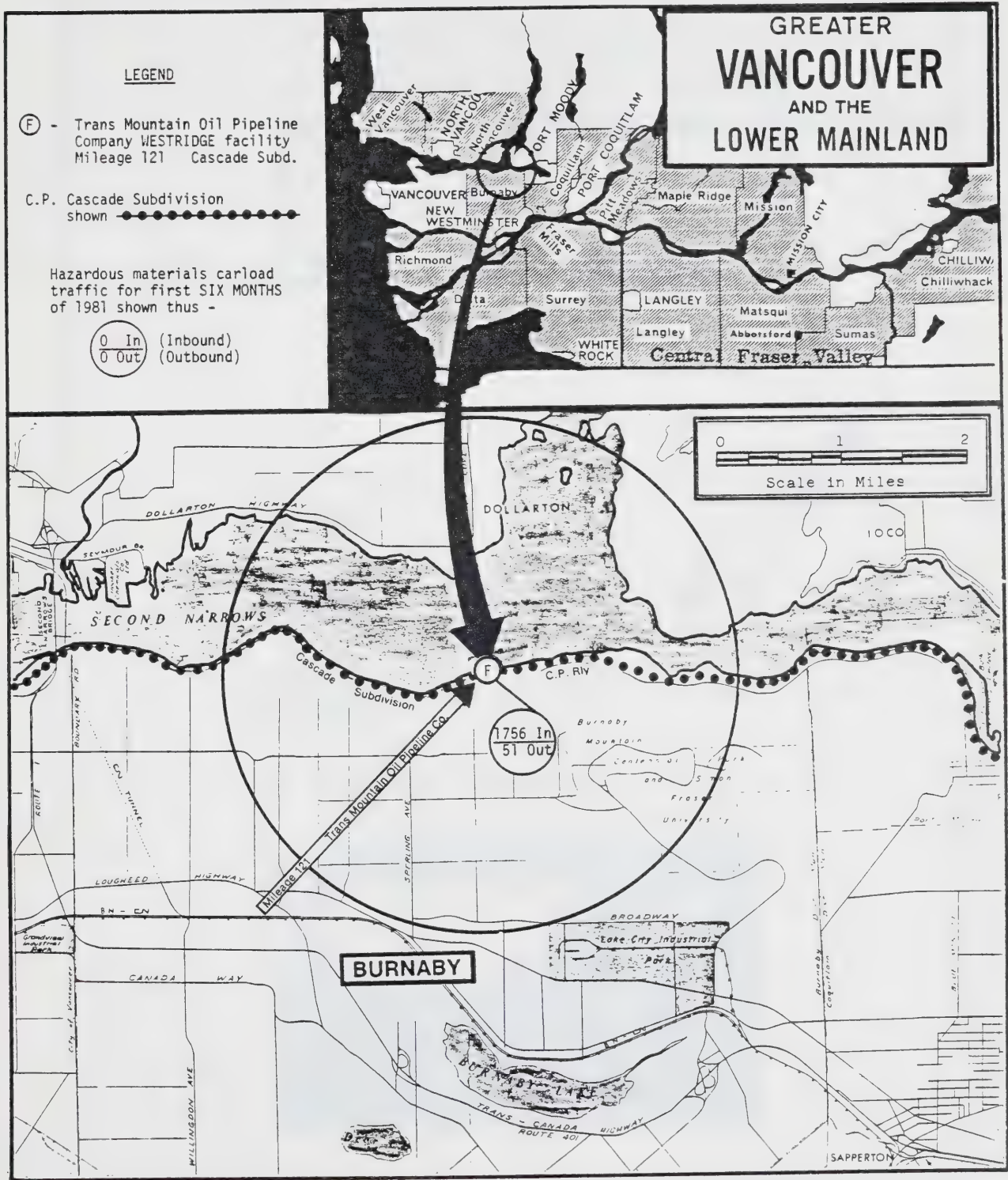


Figure 13 Westridge Terminal details; Burnaby, B.C.

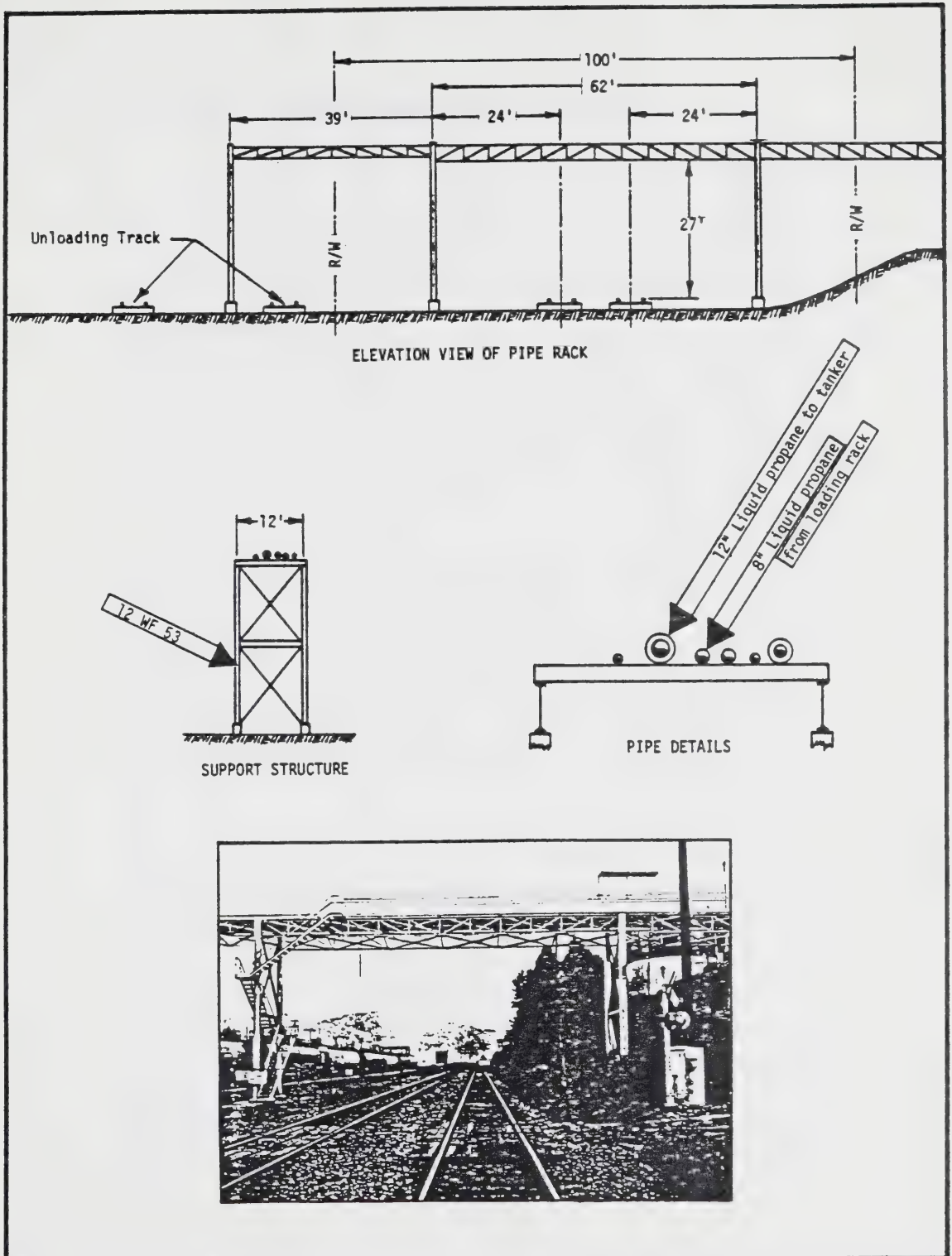


Figure 14 Details of Westridge Terminal pipe rack

3.3 SERVICES TO MAJOR INDUSTRIES (continued)

"Trans Mountain Pipe Line Company Ltd. own and operate a marine terminal situated on Burrard Inlet at Westridge in Burnaby, B.C. This facility was originally designed for loading tankers with crude oil for offshore delivery, and was subsequently redesigned to receive liquified petroleum gas by railway tank car for temporary storage and loading aboard refrigerated tankers.

Liquified petroleum gas storage is provided in two double walled, insulated tanks, each of 175,000 barrels capacity located south of the CP main line Cascade Subdivision. A 12 inch pipeline carries liquid propane from the storage tanks, over the CP tracks at approximately Mile 121 Cascade Subdivision, to a tanker loading berth located on the north side of the track.

Construction of the LPG facility was started in October, 1965, and shipment to Japan commenced in October, 1966, as part of a 10 year contract. Transfer of propane from the storage facilities to tanker usually takes place once each month. At a rate of 10,000 barrels per hour, it takes about 26 hours to pump the tanker cargo of 240,000 barrels.

The railway tank car unloading facilities comprise two spur tracks, located off railway property, each

3.3 SERVICES TO MAJOR INDUSTRIES (continued)

having a seven-car-spot unloading rack, with pumping equipment designed to handle 7 cars per eight hour shift (25,000 gallons per car). Under normal circumstances seven cars are spotted each morning and seven cars late each afternoon. Distance from unloading track to nearest main track is 53 feet 6 inches, centre line to centre line.

There are two CPL main tracks which traverse the area in question, passing under the 12 inch propane transfer pipeline, and a number of smaller pipelines. These pipelines are supported by steel truss work which rests on steel columns. The clear span between columns over the two main tracks is 62 feet. The support columns on the south side are located 24 feet from centre line of the eastbound main track. Similarly those on the north side are located 24 feet from centre line of the westbound main track. Each support column consists of 2 - 12 WF 53 with cross bracing, bolted to shallow concrete footings. These supports are designed to accommodate the existing overhead loads plus 40 lb. snow loads and wind loading of 80 mph.

The entire Trans Mountain site on both sides of the CPL Cascade Subdivision is protected by a chain link fence. Access to the waterside site is provided by a private level crossing located at approximately Mile 121.15. The crossing itself has gravel approaches to 20 foot planks, crosses both main tracks, and is protected by flashing lights.

3.3 SERVICES TO MAJOR INDUSTRIES (continued)

Construction of the previously noted pipeline and storage facilities was authorized by Board Order No. 121188 dated June 22, 1966, and amended by Board Order No. 121665 dated August 11, 1966.

POTENTIAL HAZARDS

As indicated by both our own R.T.C. Dangerous Commodities people, and local Fire Marshall's representatives, the following situations could create serious hazards.

- (a) Derailed equipment on the main track could strike the columns supporting the overhead pipelines, causing rupture of the lines.
- (b) A motor vehicle-train collision at the level crossing could result in the support columns being struck, with results as in (a) above.
- (c) A train derailment could involve collision with tank cars on the unloading tracks, as well as various in-plant pipelines including the 12 inch main loading line (these lines are located above ground, parallel with and between the two unloading tracks).
- (d) An inadvertent act could cause a fire and subsequent difficulties in the tank car unloading area. This because all traffic to the dock, both vehicular and pedestrian must be routed through the tank car unloading area.

3.3 SERVICES TO MAJOR INDUSTRIES (continued)

DISCUSSION

Several meetings with the Industry and local fire protection Officers together with Railway representatives have been undertaken. As a result of these discussions, Trans Mountain Oil Pipeline Company has made a number of proposals, based on recommendations received from an independent Consultant.

Some of the work which the Industry is proposing relates to the control of vehicular and pedestrian traffic, access for tanker crews and emergency services to the dock site. These matters are being handled by the Provincial and Municipal Fire protection agencies as it relates to the unloading site which is located off operated right-of-way.

With regard to the construction of additional protection for the support structures, as suggested by the Operating Department of the R.T.C., the Industry has suggested that such devices would be impractical. I would concur in this viewpoint, and feel that any deflective or impact-absorbing structure would introduce many problems without necessarily providing much real protection. Aside from the fact that such construction would necessitate major plant revisions, including track re-alignment, it could conceivably create a situation where derailed equipment could be deflected into the tank car unloading area. In any

3.3 SERVICE TO MAJOR INDUSTRIES (continued)

event no protection would be provided for the unloading facilities, or the pipelines which are located a few feet above ground level between the two unloading tracks.

It would seem to me that in view of the potential hazards involved should a significant derailment occur in this area, both the public and the Railway would be best served if the possibility for such a derailment occurring were minimized. To this end Industry will exercise strict control of vehicular access to the level crossing by installing a permanent gate, thereby reducing the possibility of crossing accidents. As well they are proposing to install guard rails as shown on attached print of Drawing No. 20117, Sheet E2, at an estimated cost of approximately \$10,000".

Subsequent to development of the above-noted report, a speed restriction of 20 miles per hour was applied to all rail movements passing the Westridge Terminal.

Some correspondence highlights relative to the facility in question are summarized as follows:

December 23, 1974 By letter, Trans Mountain indicated that as a result of a detailed study the following conclusions had been reached.

"1. Proceed early in 1975 with the installation of guard rails at an estimated cost of \$10,300."

"2. Not prepare to construct an impact-absorbing structure between the CP

3.3 SERVICE TO MAJOR INDUSTRIES (continued)

Rail main tracks and the unloading facility."

It was further stated that the plant was built after receiving approvals from all concerned. That there had been no accidents or near misses while trains operated at 40 miles per hour for 8½ years, etc., "Should the contract (for export of LPG) be extended or renewed for another 10 year period (they)... will be pleased to re-assess the need for this structure".

June 3, 1975

Letter from Chief Engineer Trans Mountain to Secretary, RTC, Ottawa "...We have had further discussion with C.P. Rail regarding the installation of Jordan Guard Rails and early indications are that the objections raised by the railway will be successfully resolved."

August 1, 1975

Letter from CP Law Department to Secretary, RTC, Ottawa "...The Railway has no objection to the installation of guard rails.... situation will be reassessed in a years time...(re)...removal of 20 mph slow order. It would be desired at that time to have the overhead pipeline placed underground." (emphasis added)

3.3 SERVICES TO MAJOR INDUSTRIES (continued)

January 22, 1976 Letter from Chief Engineer Trans Mountain to Secretary, RTC "we have now reached an agreement...that we install guard rails on the main line."

June 7, 1976 Letter from Chief Engineer Trans Mountain to Secretary, RTC "the reason for the delay in the guard rail installation is because of an unsettled item covering liability in the event of derailment..."

November 4, 1976 Letter from CP Rail to Secretary, RTC "In view of...restrictive slow order since mid-1974,...suggested Committee recommend...they place their pipelines underground and protect their facilities with an earthen dyke." (emphasis added)

November 5, 1980 Conversation between RTC Regional Staff and CPR/Trans Mountain staff as follows: Trans Mountain Chief Engineer indicated time was approaching when Trans Mountain would be renewing contracts for export. Jordan rail was not installed because of objections by CP Rail. Railway stated that there would be no request for an increase in train speed with respect to the 20 mph slow order in existence.

November 7, 1980 RTC Regional office recommended to Headquarters that the installation of Jordan Rail be made compulsory.

3.3 SERVICES TO MAJOR INDUSTRIES (continued)

Against the above-noted background, observations as follows are offered:

- (a) Potential for disaster is substantial. Sixteen hours per day tank cars of propane are being unloaded in close proximity to a well-travelled main track. The centre line to centre line distance from near unloading track to adjacent main track is 53 feet 6 inches.
- (b) Very large quantities are involved. At any given time there may be fourteen tank cars with a combined capacity of 350,000 gallons of LPG being unloaded. The two storage tanks on site can accommodate in excess of 12 million gallons. The transport vessel has a capacity of some 8 million gallons.
- (c) Exposure is significant. Sixteen hours per day propane is being pumped through 3 inch lines over the CP main tracks. When the LPG tanker is loading a 12 inch line is utilized to accommodate a flow rate in excess of 350,000 gallons PER HOUR over the CP main tracks (this is the equivalent of 14 tank cars per hour).
- (d) Although the plant is located on a relatively isolated section of Burrard Inlet, it also abuts a residential area in Burnaby. It is estimated that there may be a population of some 1,000 to 2,000 people within a 2000 foot radius of the facility.

3.3 SERVICES TO MAJOR INDUSTRIES (continued)

It is suggested that the status of current export contracts with respect to the Westridge Terminal should, at this stage, be discounted as a factor with respect to remedial action which might be contemplated. Furthermore, the following recommendations are put forth with respect to the Westridge facilities of Trans Mountain Oil Pipeline Company in Burnaby, B.C.

Recommendation 9 Trans Mountain Oil Pipeline Company be requested to indicate why the supporting structures for the overhead LPG pipelines at Westridge cannot be eliminated within 50 feets of the centre line of the two existing main tracks (if, after such modification, the lines remain overhead, existing vertical clearances to be maintained). It is suggested that if such changes cannot be completed by December 31, 1983, the Committee consider ordering the discontinuance of rail service to the plant.

Recommendation 10 That CP Rail be ordered to impose a further reduction in train speed at the above noted location. Speed to be restricted to 10 miles-per-hour until such time as the modifications noted in recommendation (9) above are completed, at which time an application for review will be entertained.

3.4 INTERCHANGE FACILITIES

With respect to Hazardous Materials, much of the interchange activity in the metropolitan area occurs in the vicinity of Sapperton. This area is located north of the Fraser River and lies partially within the boundaries of three communities. New Westminster, Burnaby and Coquitlam as illustrated in Figure 15. General cargo moving through the area relates primarily to Canadian National and Burlington Northern mainline flows, but also accommodated is some B.C. Hydro and Canadian Pacific traffic. In close proximity to one another are interchange facilities for these companies.

The geographic centre of this area of activity is traversed by Brunette Street, the Trans Canada Highway and the nearby Lougheed Highway. A short distance south, Highway 99A crosses the Fraser River adjacent to a swing span railway bridge which accommodates the four railways. Thus an incident involving hazardous materials in the Sapperton area could dislocate a substantial portion of the metropolitan road and rail traffic. Vehicular counts indicate a combined daily traffic volume of some 190,000 using the four main roadways in question (Trans Canada, Lougheed, Brunette and 99A).

Aside from populations exposed along rail access routes to the interchange area, some 25,000 to 30,000 people live within 2000 feet of the trackage between the most easterly interchange (CP/CN) and the most westerly interchange (CP/B.C. Hydro); approximately 50,000 people reside within one mile of the same trackage.

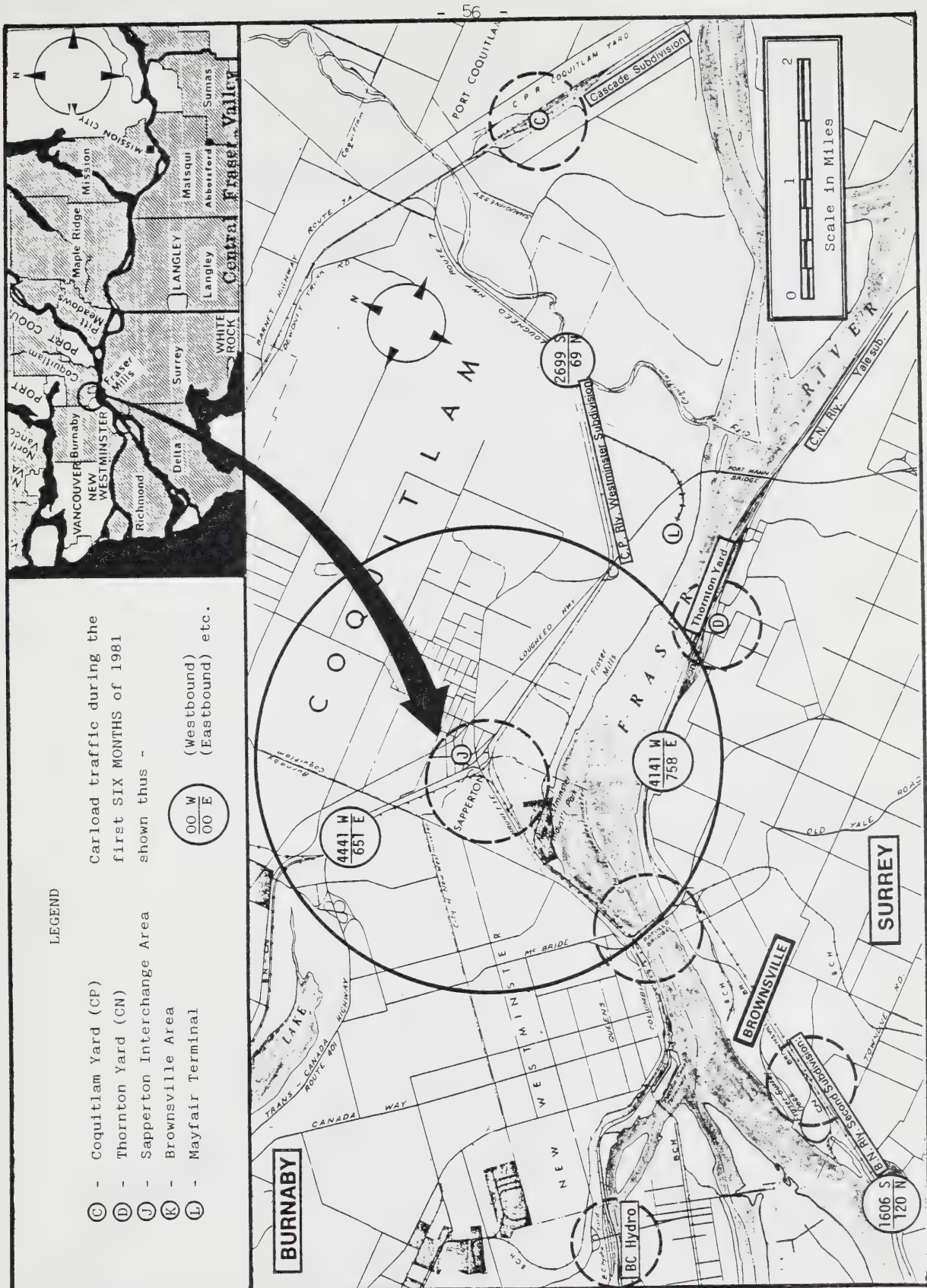


Figure 15 Sapperton Interchange Area

3.4 INTERCHANGE FACILITIES (continued)

Emphasis should be placed upon minimizing the volume of hazardous material entering this corridor, and expediting the movement of that traffic which must pass through the area.

CN/BNI Interchange Traffic

At the present time, CN interchange cars are moved from Thornton Yard which is located on the south side of the Fraser River, to Sapperton on the north side of the River. This is done via the Department of Public Works swing span bridge and a portion of the New Westminster waterfront. Burlington Northern then backhauls the traffic through the same waterfront area and over the D.P.W. bridge for continuation to U.S. destinations.

During a six month period the carload quantities observed to be handled in this fashion included:

- 555 - Liquified Petroleum Gas (Alberta to Washington)
- 180 - Vinyl Chloride (Alberta to California)
- 52 - Ammonia Nitrate
- 10 - Solvents
- 5 - Chlorine
- 3 - Hydrochloric Acid
- 3 - Poisonous liquids
- 1 - Carbon bisulphide

809 - Total SIX MONTH BNI/CN Interchange Traffic

This traffic, which represents an annual volume of 1500 to 2000 carloads, could be kept out of the New Westminster/Sapperton area if CN/BNI interchange was undertaken on

3.4 INTERCHANGE FACILITIES (continued)

the south side of the Fraser River. It could possibly be accommodated in an area such as Brownsville without major changes to existing facilities. Separating the hazardous goods (which account for only a small percentage of the total traffic interchanged) would of course necessitate operating changes, however, it is suggested that such handling might not incur insurmountable difficulties.

Recommendation 11 C.N. Rail and Burlington Northern Inc. be directed to advise why hazardous materials presently being interchanged in Sapperton cannot be exchanged on the south side of the Fraser River - possibly in the Brownsville area.

CP/BNI Interchange Traffic

Emphasis has recently been placed on directing longer haul U.S. destined traffic through CP facilities at Huntingdon, thus avoiding the metropolitan Vancouver area entirely. However, traffic for the nearby Anacortes, Washington area is handled through Coquitlam and Sapperton from whence Burlington Northern moves the materials through New Westminster and on to U.S. destinations. The hazardous goods accommodated in this fashion are comprised almost entirely of liquified petroleum gas from Alberta. In a six month observation period, the following regulated commodities were transported in this fashion:

692 cars - liquified petroleum gas (Alberta to
Washington)
3 cars - ammonia nitrate
1 car - sulphur dioxide

INTERCHANGE FACILITIES (continued)

This kind of traffic which presently amounts to some 1500 cars annually and appears to be expanding, could by-pass much of the densely populated metropolitan Vancouver area if a new interchange facility was constructed in the Mission/Huntingdon area. Such an arrangement is discussed in a following section of this report. In the absence of such a facility the policy of C.P. Rail should be to minimize handling in the Sapperton area. To this extent procedures instituted to eliminate backhaul movements through the westerly portion of the New Westminster Waterfront must be adhered to.

Recommendation 12 That CP Rail be advised that CP/BNI hazardous materials interchange traffic must be exchanged directly in Sapperton without backhaul movement through the westerly portion of the New Westminster waterfront.

3.5 RE-ROUTING OF TRAFFIC AND A TRANSPORTATION PLAN

The possibility of re-routing dangerous commodity THROUGH traffic around population concentrations in the Lower Mainland has already been discussed in this report within the context of potential consolidation of Ferry Traffic. Recommendation (3), Part 3.1, makes reference to the desirability of an Industry/Community sponsored Transportation Plan which might be developed in association with potential funding assistance under terms of the Rail Relocation and Crossing Act.

Such a plan could conceivably examine the possible construction of a new interchange/holding facility as illustrated in Figure 16, which would, among other things, provide alternate routing for dangerous commodities destined for the United States. It would also provide several options with respect to ferry traffic which might be moved to Tilbury Island or to some alternate location such as Roberts Bank. A tabulation of various routing possibilities based on present day volumes is shown in Figure 17. The data indicates that, at a minimum, some 900 carloads of hazardous materials would no longer be moved through the metropolitan area. With some effort, approximately one-half of the total volume of regulated traffic could be re-directed away from some of the more densely populated lower mainland communities.

One of the immediate benefits of a new interchange facility in the location shown would be the provision of relief with respect to road/rail conflict in the nearby community of Chilliwack. It has long been a contention of the City that B.C. Hydro/C.N. Interchange switching (which amounts

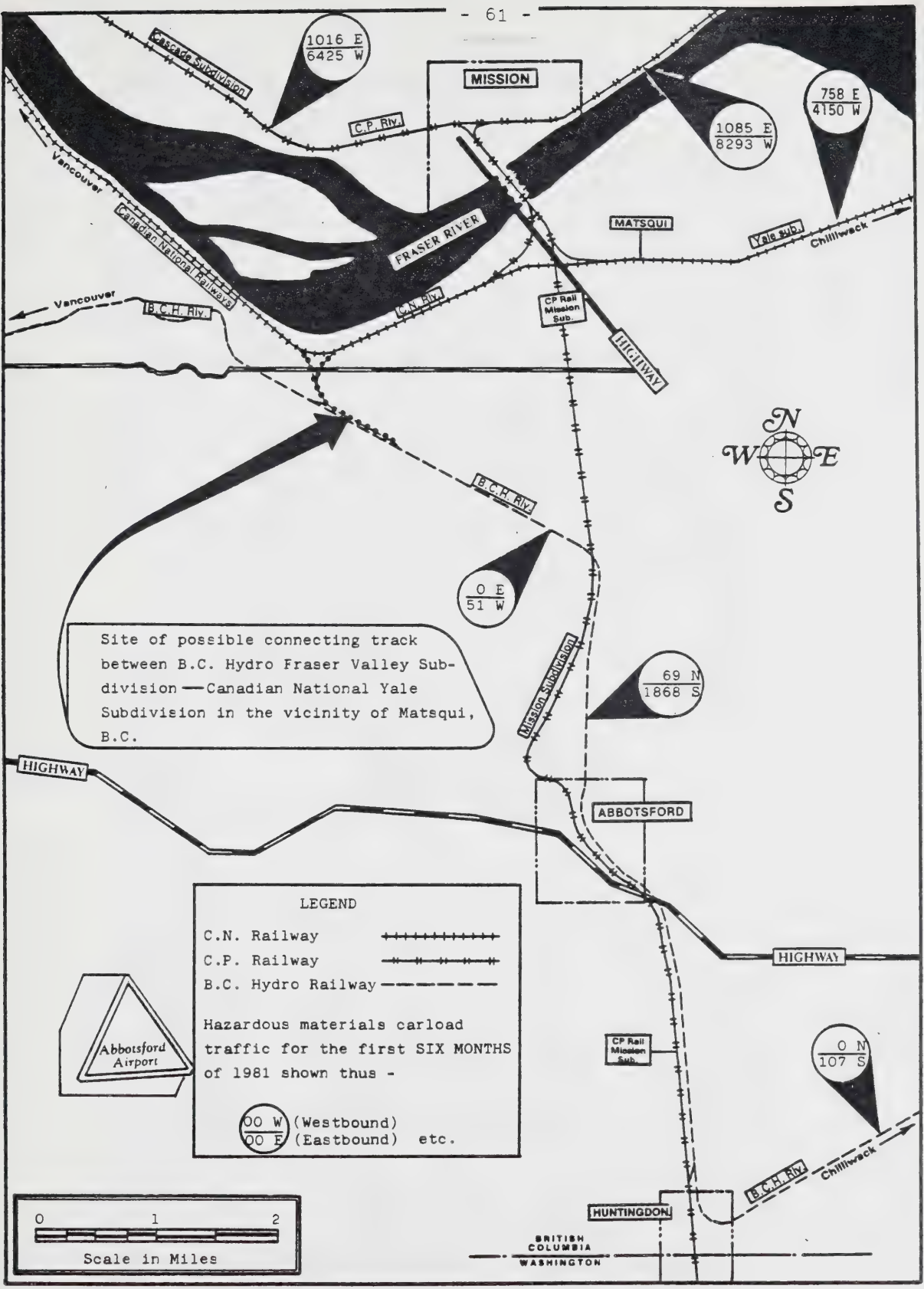


Figure 16

ORIGINATING	DESTINED			PRESENT ROUTE	POSSIBLE FUTURE ALTERNATE ROUTES				
	Long Haul South (U.S.)	Anacortes area Washington (U.S.)	Ferry to Vancouver Island etc.		If Interchange is built at Matsqui			Remove from Sapperton by going direct Via	
					Matsqui Huntingdon	Matsqui Colebrooke	Matsqui Thornton Tilbury		
CN/ENI	900			<u>Thornton Sapperton</u>	900			<u>Thornton Brownsville</u>	<u>Sapperton Brownsville</u>
CN/ENI		750		<u>Thornton Sapperton</u>		750		750	
CP/ENI		1400		<u>Coquitlam Sapperton</u>		1400			
CP			2100	<u>Coquitlam Vancouver</u>		2100	2100		2100
CN			150	<u>Thornton Tilbury</u>		150			
TOTALS	900	2150	2250		900	4400	2100	1650	2100

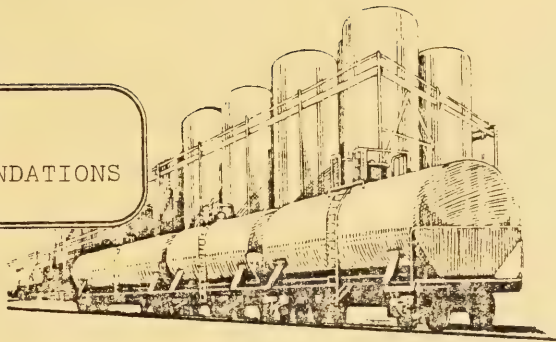
Figure 17 Tabulation showing future routing possibilities based on present day volumes

3.5 RE-ROUTING OF TRAFFIC AND A TRANSPORTATION PLAN

to some 10,000 ± 12,000 cars annually) is the primary cause of road/rail difficulties. Chilliwack has been attempting to address the problem of financing a grade separation for a number of years, and the need for such a facility might be postponed should a new interchange be constructed.

The re-routing of traffic - particularly hazardous goods - and the construction of new facilities would no doubt encounter the same patterns of resistance already experienced by CP Rail in their preliminary efforts to establish a holding yard. However, it is suggested that if there is a need for long-term objectives with respect to the movement of dangerous materials, then the development of the necessary strategies and ultimately the gaining of approval and the absorption of costs should not necessarily be the sole responsibility of the railways.

PART 4
SUMMARY & RECOMMENDATIONS



PART 4

SUMMARY AND RECOMMENDATIONS

The preceding sections of this report provide details with respect to certain aspects relative to the handling of some 20,000 to 25,000 carloads of hazardous materials which are moved by rail through the Metropolitan Vancouver area each year.

The following comments represent a brief recapitulation, together with a summarization of the recommendations, which have been put forth for consideration.

PART 4 SUMMARY AND RECOMMENDATIONS (continued)

4.1 FERRY SLIP TRAFFIC AND INSTALLATIONS

At present, the ferry slip facilities being operated by the major railways are so dissimilar that interchangeability is very difficult. This leads to a lack of flexibility in accommodating diversions of traffic on either a planned or an emergency basis. It is suggested that a programmed approach to eventual compatibility of facilities be considered.

There should be a phasing out of the movement of hazardous materials through the present Canadian Pacific ferry slips, as well as the Burlington Northern facility. In the absence of any obvious other alternatives, it is suggested that the CN installation at Tilbury Island might be considered for the accommodation of such traffic. In this connection there is a possibility that the provisions of The Railway Relocation and Crossing Act might be used as a vehicle for the development of viable alternatives. To do this a Transportation Plan would be required.

Specific Recommendations as put forth in Section 3.1 of this report are as follows:

<u>Recommendation 1</u>	Canadian National Railway
	Canadian Pacific Railway
	Burlington Northern Inc.

be requested to prepare submissions concerning the feasibility of establishing a standard Ferry Slip configuration to

SUMMARY AND RECOMMENDATIONS (continued)

accommodate West Coast traffic. Such standard to be consulted when Railway Transport Committee approval is sought for alterations or new construction.

In this connection, the Railways shall make available to each other and to the Commission a package containing detailed information with respect to their Lower Mainland ferry slips, including configuration, load limitation, operational restrictions, approach characteristics and an inventory of vessels and barges presently being utilized.

Recommendation 2 Canadian Pacific be requested to prepare a submission with respect to possible scheduling modification to hazardous materials traffic moving through their Vancouver slips. This with a view to minimizing public exposure.

Recommendation 3 By copy of this report the suggestion be made to:

- (a) Greater Vancouver Regional District
- (b) Canadian National Railway
- (c) Canadian Pacific Railway
- (d) Burlington Northern Railways
- (e) The City of Vancouver
- (f) The City of Chilliwack

and other interested entities;

SUMMARY AND RECOMMENDATIONS (continued)

That consideration be given to the preparation of a Transportation Plan relative to the movement of hazardous materials with particular reference to the framework provided by The Railway Relocation and Crossing Act as a vehicle for the development of a transportation corridor with appropriate supporting facilities.

Note: See also Section 3.5 of this report concerning re-routing possibilities.

Recommendation 4

Canadian Pacific Railway be requested to give reasons why:

- (a) Carload lot shipments of LIQUIFIED PETROLEUM GAS AND EXPLOSIVES cannot be diverted from the Vancouver Ferry Slip facilities by June 1, 1983.
- (b) Carload lot shipments of ALL DANGEROUS COMMODITIES cannot be diverted from the Vancouver Ferry Slip facilities by June 1, 1984.

Recommendation 5

Canadian Pacific Railway be advised that in the event satisfactory arrangements cannot be made to accommodate hazardous materials moving through the Vancouver Ferry Slip facilities, severe operating

SUMMARY AND RECOMMENDATIONS (continued)

restrictions may be applied by the Committee.

Recommendation 6 Burlington Northern Inc. be requested to give reason why carload lot shipments of ALL DANGEROUS COMMODITIES presently being handled through their Vancouver Ferry Slip installation cannot be diverted to other facilities by June 1, 1984.

4.2 COQUITLAM YARD - CP RAIL

Coquitlam Yard is a large flat-switched facility which occupies a substantial portion of the City of Port Coquitlam (population 27,500). In effect, it serves as the westerly terminus of the Transcontinental CP route. The annual movement of hazardous materials through the yard totals some 12 - 13,000 carloads moving westward, and 2,000 carloads eastbound. .

With the exception of a portion of the liquified petroleum gas movement destined for the Westridge Terminal facilities of Trans Mountain Oil Pipeline Company in Burnaby, hazardous materials moving into Coquitlam Yard are essentially handled as THROUGH traffic. In the recent past CP Rail has been under some pressure to develop a remotely located holding facility for dangerous commodities. It appears that such a facility would be used in large measure to provide surge capacity for Westridge.

SUMMARY AND RECOMMENDATIONS (continued)

There are possibilities associated with the redirection of through traffic in conjunction with the development of a Transportation corridor, and these should be pursued, however in the interim the following proposals are put forth with respect to the handling of hazardous materials in Coquitlam Yard.

Recommendation 7 Present efforts to establish a remote holding compound exclusively for CP Rail dangerous goods traffic be discontinued.

Recommendation 8 That the terms of the Special Permit covering the holding of dangerous goods in Coquitlam Yard be modified as follows:

- (a) Effective January 1, 1983, the maximum number of loaded tank cars of Liquified Petroleum Gas destined Westridge Terminal on hand at any time in Coquitlam Yard shall be limited to the equivalent of three (3) days average daily requirement at Westridge Terminal.
- (b) Effective June 1, 1984, the maximum number of loaded tank cars of Liquified Petroleum Gas destined Westridge Terminal on hand at any time in Coquitlam Yard shall be limited to the equivalent of two (2) days average daily requirement at Westridge Terminal.

SUMMARY AND RECOMMENDATIONS (continued)

4.3 TRANS MOUNTAIN OIL PIPELINE COMPANY

WESTRIDGE TERMINAL - Mile 121 Cascade Subdivision, CP Rail

Located on Burrard Inlet, this facility is bisected by CP Rail's double-track Cascade Subdivision. Liquified Petroleum Gas is unloaded from tank cars on the water side of the track and pumped over the railway to storage facilities built on the hillside above. Once each month LPG is pumped back over the tracks to a large ocean-going vessel for export to Japan.

The hazards which are perceived to exist at this location are not so much related to population density, although it is estimated some 1,000 to 2,000 people reside within a 2000 ft. radius of the facility, rather the concerns relate to:

- (a) the magnitude of the quantities involved. The ocean tanker loads 8 million gallons in a 24 hour period. The overhead pipeline on such occasions is accommodating 350,000 gallons per hour.
- (b) the kinds of exposures involved - 16 hours per day LPG is being pumped in lines which are in an exposed position.
- (c) Proximity to rail operations. Overhead lines are supported on trusswork located immediately adjacent to the main track. Tank cars unloading is also being undertaken on a more or less continuous basis adjacent to the same main tracks.

SUMMARY AND RECOMMENDATIONS (continued)

The following recommendations are therefore suggested with respect to the Westridge Terminal:

Recommendation 9 Trans Mountain Oil Pipeline Company be requested to indicate why the supporting structures for the overhead LPG pipelines at Westridge cannot be eliminated within 50 feet of the centre line of the two existing main tracks. (If, after such modification the lines remain overhead, existing vertical clearances to be maintained). It is suggested that if such changes cannot be completed by December 31, 1983, the Committee consider ordering the discontinuance of rail service to the plant.

Recommendation 10 That CP Rail be ordered to impose a further reduction in train speed at the above noted location. Speed to be restricted to 10 miles-per-hour until such time as the modifications noted in recommendation (9) above are completed, at which time an application for review will be entertained.

SUMMARY AND RECOMMENDATIONS (continued)

4.4 SAPPERTON INTERCHANGE AREA

Existing interchange facilities at Sapperton accommodate traffic movements between the Burlington Northern, Canadian National, Canadian Pacific and B.C. Hydro Railways as well as heavy CN and BNI through movements. A population of some 25 - 30,000 people live and work within 2000 feet of the main corridor of this traffic. Four major roadways in the area accommodate some 196,000 vehicular movements daily, thus a large percentage of Vancouver road and rail traffic funnels through this area.

It is suggested that where possible, carload traffic in dangerous goods should be expedited and minimized in the vicinity of Sapperton. Aside from the possibility of a long term redirection of a portion of the traffic passing through this area, the annual entry and backhaul of some 1500 to 2000 carloads of such materials could be eliminated if CN/BNI interchange were undertaken at an alternate location. In addition certain backhaul movements associated with CP/BNI traffic should be avoided.

It is therefore recommended that:

Recommendation 11 Canadian National Railways and Burlington Northern Incorporated be directed to advise why hazardous materials presently being interchanged in Sapperton cannot be exchanged on the south side of the Fraser River - possibly in the Brownsville area.

SUMMARY AND RECOMMENDATIONS (continued)

Recommendation 12 That CP Rail be advised that CP/BNI hazardous materials interchange traffic must be exchanged directly in Sapperton without backhaul movement through the westerly portion of the New Westminster waterfront.

4.5 RE-ROUTING OF TRAFFIC AND A TRANSPORTATION PLAN

The possibility of re-routing dangerous commodity THROUGH traffic around population concentrations has been suggested in the context of such considerations as the consolidation of Ferry traffic, the construction of a new interchange/holding facility, the diversion of U.S. destined regulated goods, etc.

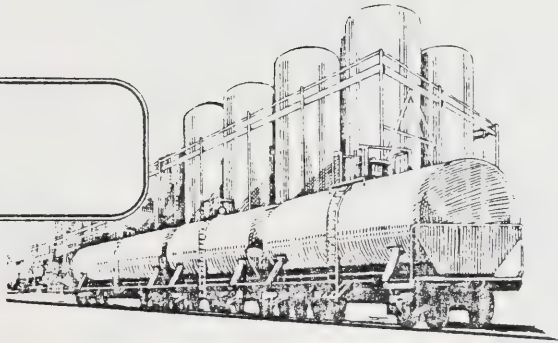
Preliminary indications are that the potential exists for the re-direction of a substantial volume of traffic away from some of the more densely populated mainland communities. In the process, some relief might accrue to Chilliwack with respect to road/rail conflict associated with existing interchange traffic.

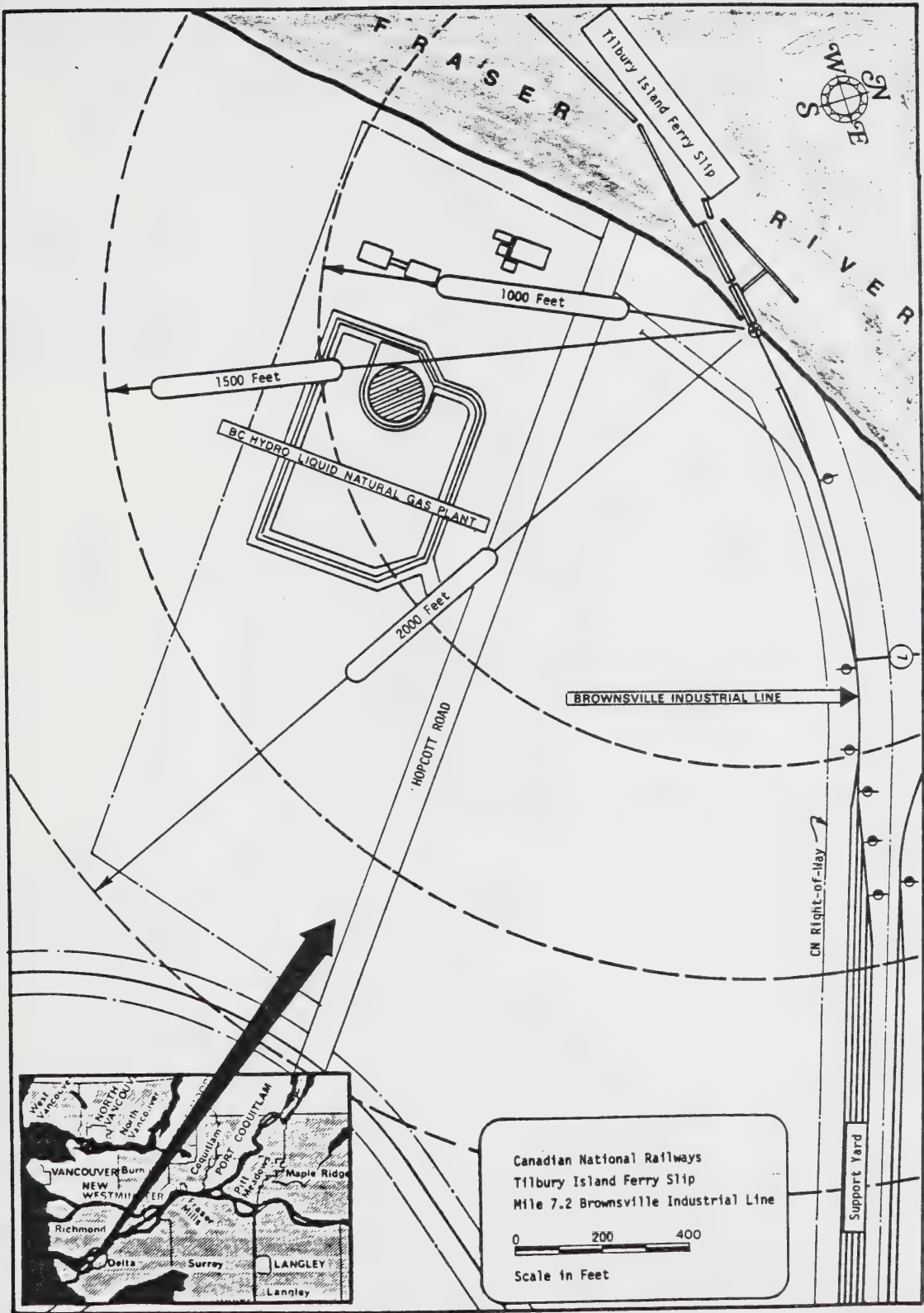
It is suggested that if there is a need for long-term objectives with respect to the movement of dangerous materials, then the development of strategies and ultimately the gaining of approval and absorption of costs should

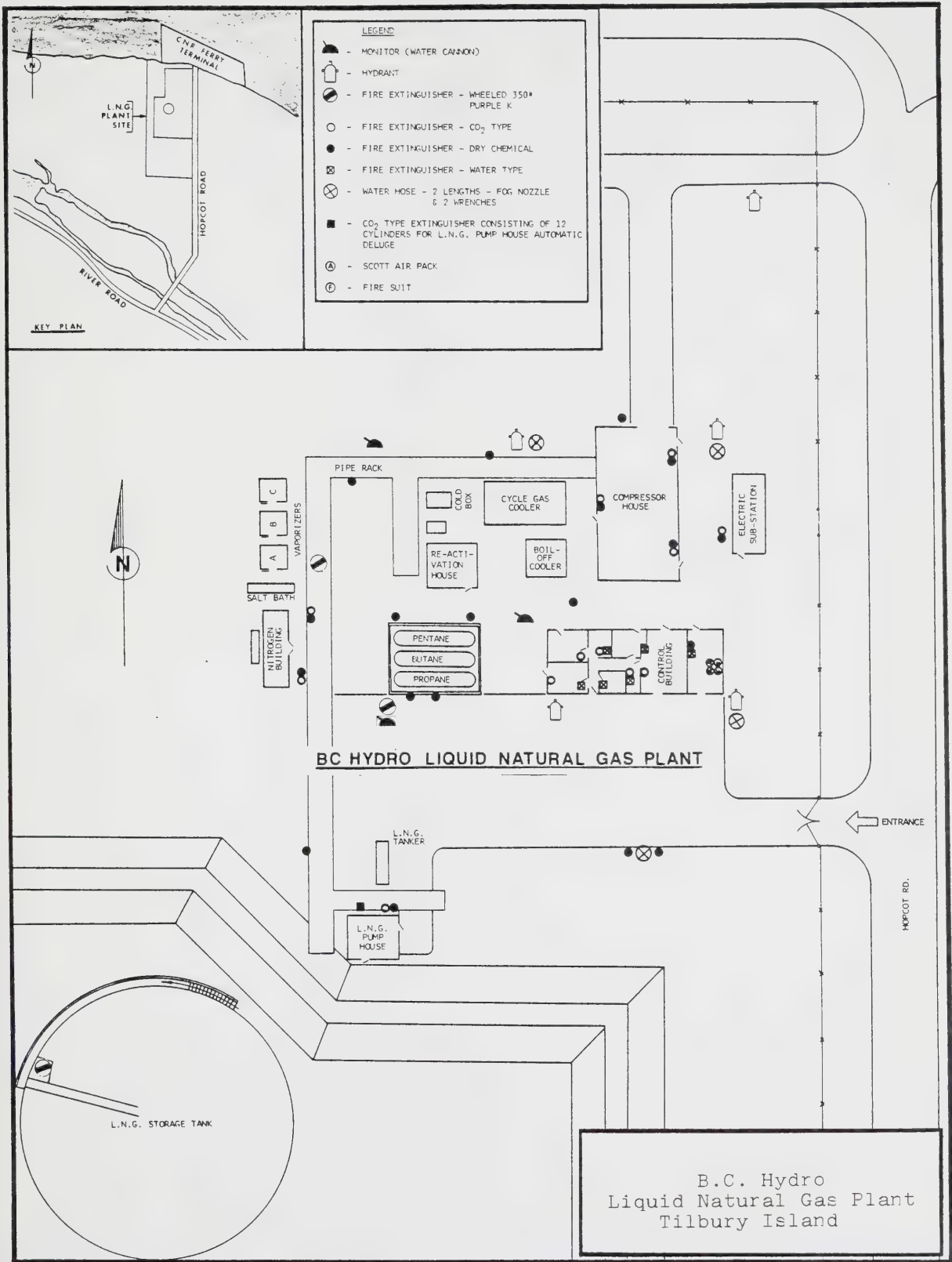
SUMMARY AND RECOMMENDATIONS (continued)

be the responsibility of the affected communities and railways. Recommendation 3, Part 3.1, makes reference to the desirability of an Industry/Community sponsored Transportation Plan which might be developed in connection with potential funding assistance under terms of the Rail Relocation and Crossing Act.

APPENDIX







NOTES

